Coal Age

FEBRUARY, 1954

A McGRAW-HILL PUBLICATION-PRICE 50c

Lower-Cost Mining

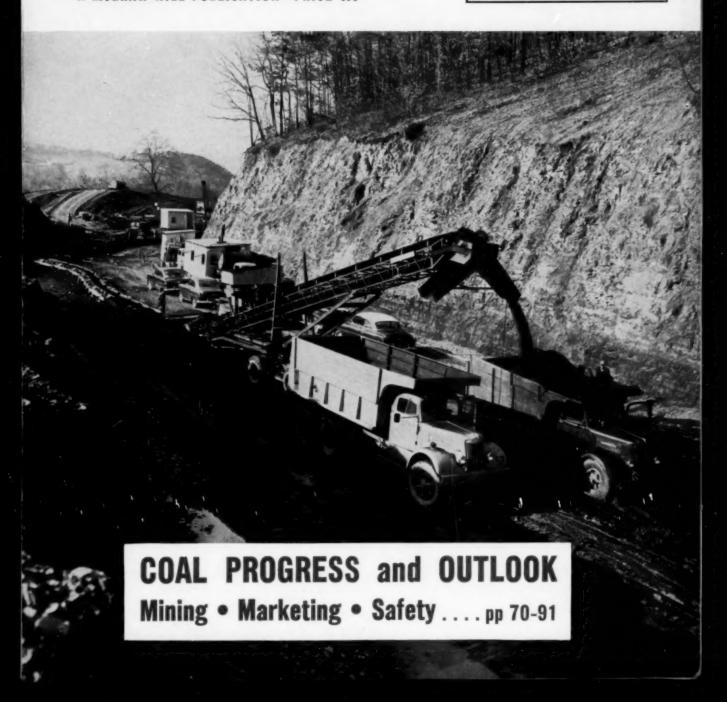
How to use conveyors to get better continuous mining. p 92

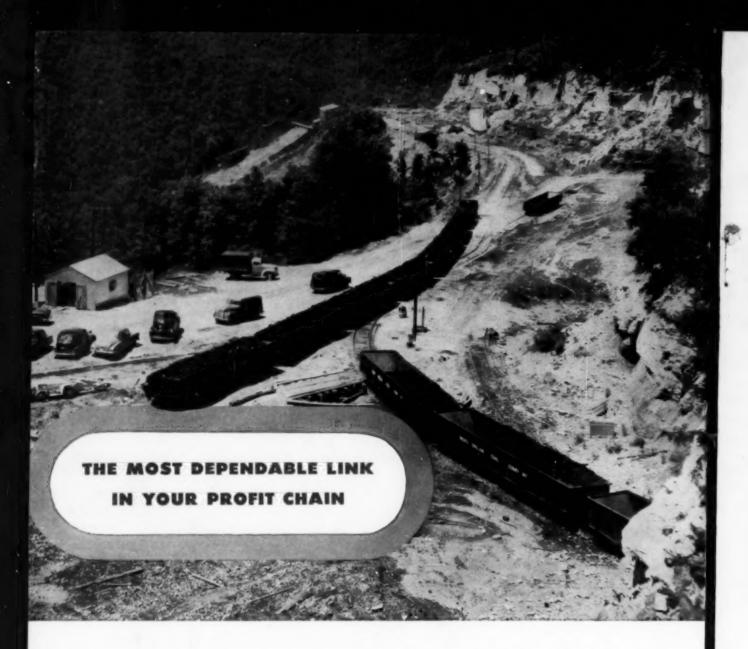
New Daylight mine teams section belts, loop track and modern mining methods. p 98

Bell & Zoller "makes money" by recovering 300 tpd of 28 M formerly wasted. p 108

A. E. Dick applies three efficiency fundamentals to strip 170 ft of cover, p 112

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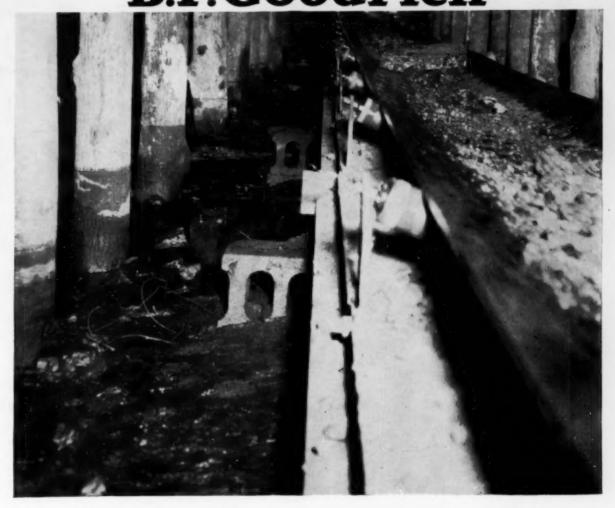


To show a healthy profit every link in the chain of production must operate with top efficiency. Today, more and more mine operators depend on Q.C.f. Drop Bottom cars to maintain that efficiency. Able to dump a 30 ton load "on the run" in just 5 seconds, the simple design of these cars also makes on-the-spot repairs possible with no slowdown in production.

Used to fill four 75-ton bins in the first step of preparation at Hampton Mines, Westmoreland Coal Company, Q.C.f. Drop Bottom cars have helped set production records for nearly 4 years. Deep mine operators save even more money by using Q.C.f. Mine cars to serve a dual purpose—to take men and materials in—bring coal out.

Whatever your mining problem it will pay off in profits for you to get the facts from your Q.C.f. Representative now. American Car and Foundry Company, New York · Chicago · St. Louis · Cleveland · Philadelphia · Huntington, W. Va. · San Francisco · Washington · Berwick, Pa.

Q.C.f., MINE CARS for Constant Haulage



B. F. Goodrich cord belt gives double protection against mildew

MILDEW is a belt killer, especially in coal mines. With most conveyor belts there's nothing to keep moisture from seeping through cover cuts and wicking across the absorbent plies of fabric in the carcass. The belt fabric rots, the belt fails prematurely. There are two reasons why this can't happen to a Caricoal cord belt, made by B. F. Goodrich.

Cords sealed in rubber

In this exclusive B. F. Goodrich design, there's a ply of parallel cords, running lengthwise, built into both the top and bottom of the belts. Each cord is completely surrounded by rubber—no cross

threads tie them together. A cut in belt admits moisture or damaging acid to only those few cords exposed. There are no cross cords to wick moisture across belt width.

Mildew inhibitors prevent rotting

As an added protection, Caricoal belts are treated with mildew inhibitors. These chemicals act directly on fungus spores, effectively inhibit belts against attack from mildew.

Cord belt at work

Mildew resistance is important in the mine where this picture was taken. That's why the owners selected the Caricoal belt with cord construction. There's been absolutely no sign of mildew and the belt looks good for years' more service.

If exposure to moisture and mine acids is shortening the life of your coal-handling belts, you need a Caricoal cord belt. Let your BFG distributor show you how these longer-lasting conveyor belts can save you money. The B. F. Goodrich Company, Dept M-178, Akron, Obio.

B.F. Goodrich INDUSTRIAL PRODUCTS DIVISION

Deep IN THE SEA OR



Deep in the sea among the fishes now modern man roams as he wishes, exploring caverns yet unsung, protected by the acqualung, a specialized product, so they tell, that does its job supremely well.

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No matter how deep your machinery goes in your coal mine, and no matter how long it stays down there, it's permanently protected by first-class LUBRICATION when it's lubricated with Hulburt Quality Grease.

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Saccialists in Coal Mine Lubrication



OF FINE COAL 1954 Model

The Bird Coal Filter is the up-to-date, streamlined (no multiple processing nor auxiliary equipment) method of getting fine coal as dry as can be obtained by mechanical means.

When ultra fine, moisture retaining, high ash particles are present in the coal, the Bird takes 'em out by a simple rinsing operation.

When slacks are loaded, the Bird effects selective recovery of the desired sizes and assures maximum recovery of the fine coal.



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PREPARATION GUIDEBOOK Coming in March Coal Age

TODAY, efficient low-cost preparation may mean the difference between operating at a profit or closing down until market conditions improve.

"The Coal Age Preparation Guidebook" will provide-in one placebasic information on the methods and equipment used today to produce quality coal at low cost.

It is designed as a parmanent, upto-date reference guide for planning new preparation plants, plant additions or changes in existing plants. Current practice, equipment available, and the reasons for their application and results, will be outlined for:

Raw-Coal Storage Raw-Coal Blending Preliminary Breaking Rough Cleaning Raw-Coal Sizing Hand Picking Washing Air Cleaning Retreatment Salvage Clean-Coal Sizing Dewatering and Drying Crushing Rescreening Mixing and Blending Dustproofing Freezeproofing Loading Water Handling and Clarification Sludge Recovery Refuse Disposal Power Maintenance Quality Control

. . Plus a convenient Buyer's Guide of the manufacturers of materials and equipment for preparation.

In addition to this special guidebook section, March Coal Age will, of course, contain its regular fare of mining articles and departments.

COAL AGE

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FEBRUARY, 1954

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NUMBER 2

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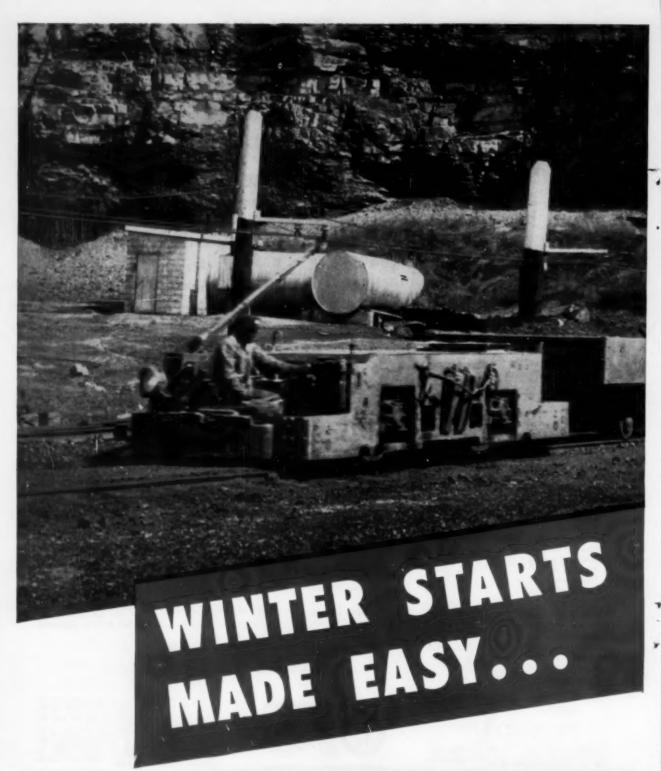
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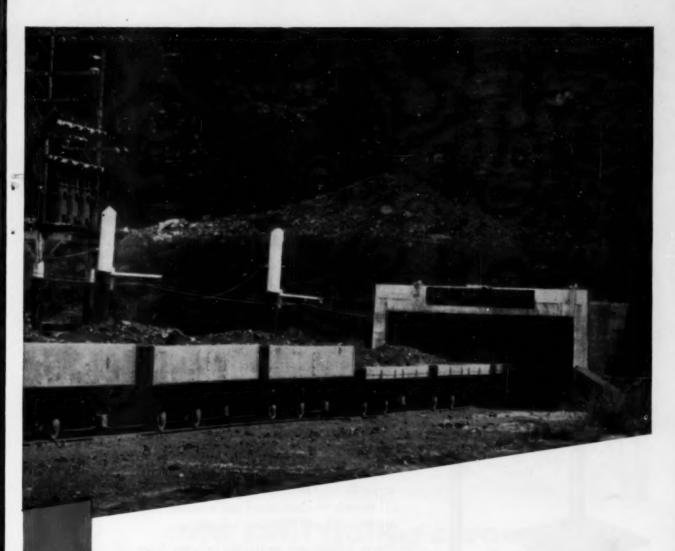


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For costly, high-speed, grease lubricated ball and roller bearings, use premium-quality *Texaco Regal Starfak*. You can bank on long-lasting protection against wear and rust—lower maintenance costs.

A Texaco Lubrication Engineer can help you simplify and improve the lubrication of all your equipment. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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Two Types for **Vertical or Angle Bolting**

Republic makes two types of roof supports to help mine operators minimize the danger of roof-fall accidents. Each type can be used for vertical or angle bolting, depending on the roof strata encountered.

All the qualities of the regular line of Republic headed and threaded products are featured in Republic Roof Bolts. Shanks are sturdy and tough ... threads are clean, sharp and accurate ... heads are square-faced for snug wrenching.

Shank lengths are available in sizes from 18 inches to 90 inches with slotted or threaded endsspecial lengths on request. Write us for additional information on Republic Mine Roof Bolts.

REPUBLIC SLOTTED BOOF BOD

A one-inch rolled-thread rod with slotted end to take wedge. Furnished with hex or square nuts and various size roof plates.

REPUBLIC ROOF BOLT

A 3/4-inch rolled-thread bolt with square-head and forged washer for additional bearing surface. Can be used in combination with roof channels, roof ties, roof plates or angle washers.

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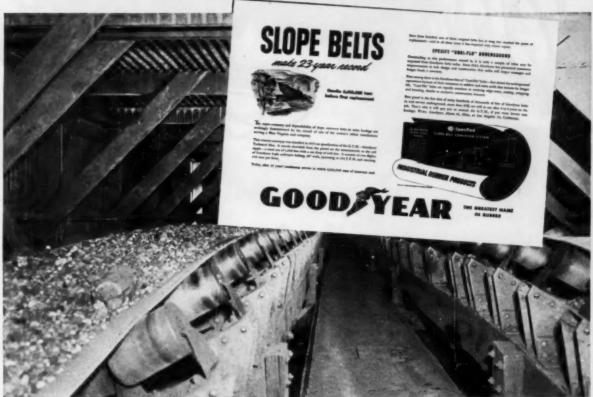
Bolt and Nut Division . Cleveland 13, Ohio GENERAL OFFICES CLEVELAND 1, OHIO Export Department: Chrysler Building, New York 17, N.Y.

REPUBLIC BOLTS AND NUTS



Other Republic Products include Pipe, Sheets, Tubing, Hot Rolled and Cold Drawn Bars — Carbon, Alloy and Enduro Stainless Steels

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Coni-Flo-T. M. The Goodyear Tire & Rubber Company, Akren, Ohio

and still going strong

In 1946, this conveyor smashed all records for length of service. It hauled over 6,000,000 tons of soft coal in 23 years of continuous operation. Today, over 75% of the original belt is still on the job with more than 10,000,000 tons in over 30 years behind it and

many more tons and years to go.

Records like this are a major reason why Coal-Flo, as specified by the G.T.M.—Goodyear Technical Man—is your best belt buy. Your G.T.M. can give you all the facts and figures you need to justify your specifying and buying Coal-

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YOUR GOODYEAR DISTRIBUTOR can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."

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Miners like Le Roi-CLEVELAND HC23RW Reverse Air Feed Drifters

Management does, too

Faster Steel Changes! No swing or dump nots to loosen and reset. Your miners simply swing drifter on feed cylinder and change steels. It's not only easy — it lets them drill out the round faster.

No Stuck Steels! Positive air feed keeps drills working at peak efficiency, avoids stuck steels.

Higher Drilling Speeds! Positive air feed plus proper force of blow and strong rotation give faster drilling speeds with both steel and tungsten carbide bits. You get longer bit life, too, and drill more footage.

Low Upkeen Cost! No feed screws on feed-screw nuts to wear. No complicated power-feed mechanism to give trouble.

Easy to Operate Built to lighten the load on your miners, Feed controls conveniently located. Reverse air feed withdraws steel from hole quickly.

Faster Set-ups! The combination of Le Roi-CLEVELAND Air Feed Drifters and air columns gives you a unit that can be set up easily and quickly. And you can get the air column in any height you want.

drilling cycles

Le Roi-CLEVELAND self-leveling Mine Jumbo with four-foot steel-change Air Feed Drifter

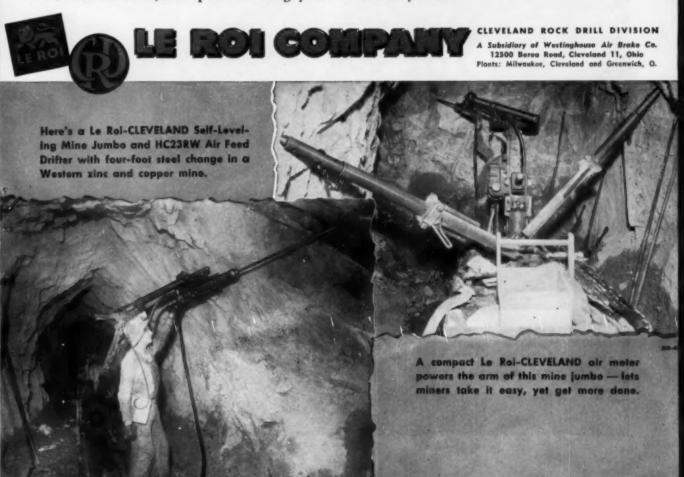
Saves time drilling lifters! Lets your miners drill the right round for any ground!

You couldn't ask for more from a mine jumbo than the performance you get from this new Le Roi-CLEVE-LAND. It's got plenty of stuff. And the payoff for you is faster cycles, greater tonnage per man-shift, lower costs! Here's why:

Self-leveling, air-motor-powered arm, lets miners spot and space holes quickly and easily, for the most efficient fragmentation. They don't have to loosen a bolt or tilt a boom, to complete the drilling cycle. Exclusive rigid screw and gearing mechanism keeps the heading straight, cuts down overbreak and underbreak. Keeps the drifters in line, prevents the steel from binding, reduces chuck wear.

Offset arm provides plenty of clearance to drill lifters — without having to take time out to swing the drill under the arm.

You can get this Le Roi-CLEVELAND Self-Leveling Mine Jumbo in either single-arm or double-arm construction. Write for further information and see for yourself how either model can help you get more done every shift,



ALLIS-CHALMERS MOTOR SCRAPERS

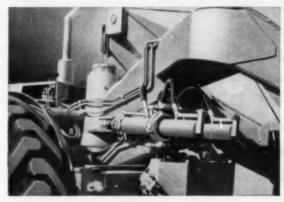
TS-300 IN ACTION
14 cu. yd. struck capacity
18 cu. yd. heaped capacity
280 hp. Buda diesel or
275 hp. Cummins diesel

the difference

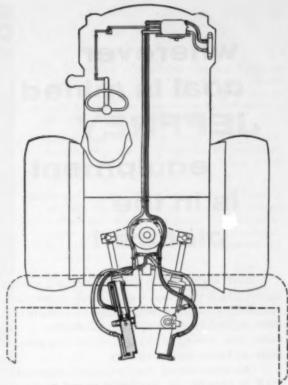
The full control built into Allis-Chalmers Motor Scrapers offers you a real advantage. There's no tiring wheel fight for the operator . . . no straining to see what he's doing. What's more, full control creates greater confidence when he's highballing a full load. He can work at his best all day long easily and safely. That means moving more dirt faster and at a lower cost.



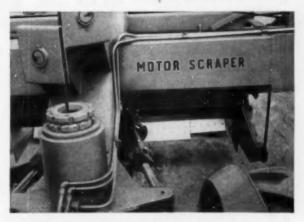
One Hand Does the Steering—the other handles the scraper controls. Fast action makes loading easy. The operator can utilize hydraulic power of steering jacks to pull through soft spots in haulways under extreme conditions.



No Weaving—No Road Shock — Hydraulic system is locked and the Motor Scraper becomes a rigid 4-wheel unit except when steering wheel is turned, thus eliminating transmission of road shock to steering wheel. Low-mounted rams, close to load line pull, mean minimum stress on the kingpin.



Easy, Fast-Action Steering — Schematic layout shows simple double-action steering system. Slightest movement of wheel opens valve of gear-type pump; release wheel and valve automatically returns to "hold." Only a one-third turn of steering wheel is necessary for a full swing of the tractor.



Excellent Operator Visibility — Clean design of low gooseneck connection gives operator unequalled view of cutting edge, helps him cut cleanly, efficiently . . . load fast and full.

Your nearby Allis-Chalmers dealer will be glad to show you and give you the full story on these job-proved *Motor Scrapers*. See them at work.

ALLIS-CHALMERS

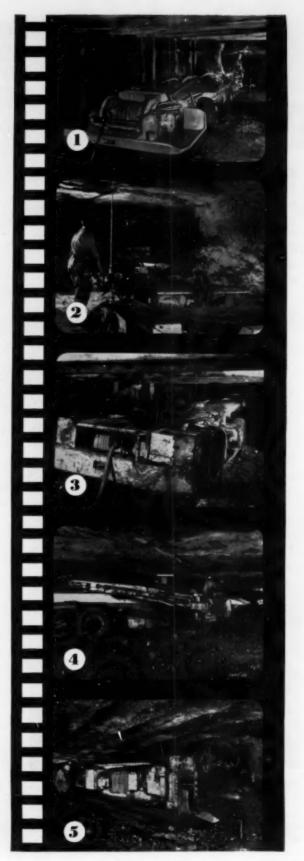
wherever coal is mined JEFFREY equipment is in the picture!

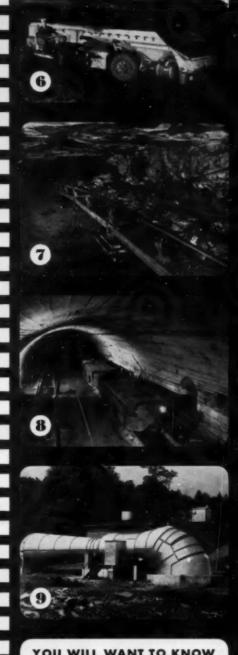
With high labor costs, mechanized mining equipment is your best way to meet competition.

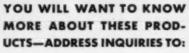
Jeffrey offers a wide range of cost-cutting units suited to your specific condition . . . to cover coal mining underground and topground. Some of them are shown here.

Our experienced, highly-trained engineering staff is capable of providing sound technical advice. If you are concerned with rising costs... it's time you found out about Jeffrey equipment.

- 56-FHR DRILLING MACHINE with wide adjustments permits locating holes in the face for most efficient shooting. All functions mechanically controlled holes drilled to required depths at any angle. Bulletin No. 831.
- 2. Type 56 RDR ROOF DRILLING MACHINE in operation. Can be arranged to put water on the drill bit, or equipped with dust collector. Adjustable torque wrench provides tightening of bolts to a uniform predetermined value of torque.
- 70-UR UNIVERSAL CUTTING MACHINE for highproductive coal cutting - mobile, compact, rugged and speedy in operation. Rotatable and adjustable cutter bars make any kind of cut any place in seam - 11" below floor level to 13' above. Catalog No. 835.
- 4. 81-A CRAWLER-LOADER for a new experience in efficient low-cost loading. Four models. Available in two heights with 10 or 15 H.P. motors. Rated capacities 6 and 8 tons per minute.
- 5. The COLMOL marks a new era in coal mining. A powerful, rugged machine mines and loads in one operation without use of explosives. Advances continuously into a solid seam at the rate of 24" per minute. Removes coal from an area 9½ wide by 38" high and up.







- 6. SHUTTLE CARS are available in several heights—capacities up to 10 tons. An elevating front section for discharging directly into mine cars or to main haulage conveyors is standard. Flexibility increases production—cuts cost.
- CONVEYORS in both chain and belt types meet capacity requirements under varying conditions and types of service. A wide range of sizes at low initial investment. Catalog No. 820.
- 8. JEFFREY LOCOMOTIVES have served the industry for more than 60 years. As more mines became mechanized, Jeffrey developed locomotives of greater capacity to haul increased tonnages. Available in trolley, cable-reel and storage-battery types. Catalog No. 836.
- JEFFREY AERODYNE FANS may be arranged to force air into the mine or to exhaust air from it. Easy adjustments up to seven different blade pitches. For safe, adequate mine ventilation investigate Jeffrey Aerodyne Fans. Catalog No. 797.



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We give truck axles a brutal

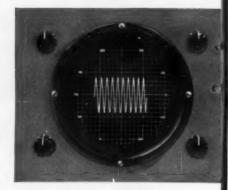
in the new Timken-Detroit indoor proving ground...and only

We torture them...shock-load, over-speed and jerk them...
twist, strain and abuse them. We match every on-the-job hauling
condition...then throw in a few devilish tricks of our own!

The result? You know for sure that any Timken-Detroit axle can take more abuse on the job it was built for than any other axle made!

To prove it, we moved a huge proving ground indoors. In one room we can simulate any hauling situation—our engineers can apply 50 years of experience to perfecting axles for modern trucks, buses and trailers, and measure performance with scientific precision.

This research pays off in longer truck life; less maintenance, repairs and downtime; lower operating costs. No wonder Timken-Detroit axles with Hypoid gearing rate "first" with wise truck owners!



TDA proves axle quality and performance in this "Torture Chamber"

Here we simulate actual highway conditions...test quality and performance of axles under any hauling situation, such as duplicating the kinetic energy of 80,000 lbs., G.C.W., at 60 m.p.h. All tests are repeated hour after hour with an automatic cycling control.



Whatever you haul... simulated service conditions show up electronically on a screen like this. For instance—a heavily loaded truck on a bumpy, twisting road—then on a level express highway or long grade. What happens to the axle and gearing is measured, charted with absolute scientific accuracy.







You're houling overburden . . . you want axles that can get you up, out and on the road—fast . . . with few shifts, low engine r.p.m. and skimpy gas consumption. You want to stay on the job . . . with little expense for maintenance or repairs plus long axle life. You want Timken-Detroit "Torture-Tested" axles with Hypoid gearing!

You're hauling out of the pit...loaded to capacity. It's all uphill . . . on soft, twisting makeshift roadway. It's a job for "man-sized" axles and gearing—units that can take rugged going—and not beat the engine and driver to pieces, nor run up costly repairs and shop time. A job for Timken-Detroit "Torture-Tested" axles with Hypoid gearing.

You're down to coal...working on any ground that'll stand still . . . you need quick mobility, power—and tonnage per day, too! You want a shovel combination that won't call it "quits" when going's rough. You want rugged gearing and axling . . . easy, low-cost maintenance, economical operation. You want Timken-Detroit "Torture-Tested" axles.

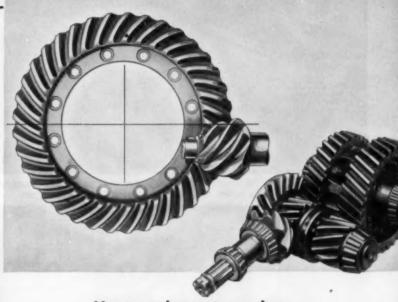
beating

Timken has it!



"TORTURE-TESTED" to Save Money on the Job

WORLD'S LARGEST MANUFACTURERS OF AXLES FOR TRUCKS, BUSES AND TRAILERS



Next equipment you buy . . . specify Timken-Detroit Hypoid gearing

Hypoid gearing for truck axles was pioneered by Timken-Detroit.

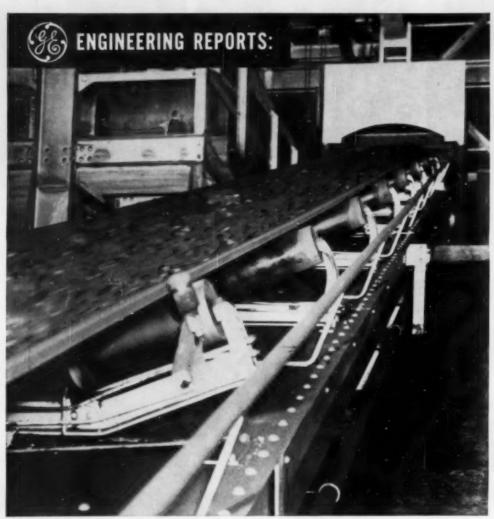
Proved in billions of tor-miles of actual operation. Designed to give the slower gear ratios necessary for modern engines without loss of strength. Pinion is bigger, stronger... bearings are larger... more teeth in contact reducing loading per unit of contact area. Torque transmitting capacity increased to step up performance and rugged power.

Double the gear combinations

Get interchangeability, too! Only Timken-Detroit has Hypoid gearing in a complete "family" of 7 basic axle capacities—in the entire range of medium and heavy-duty requirements. This advanced-related design incorporates the same features of construction and interchangeability in single-speed; single-speed double-reduction; and two-speed double-reduction final drive units.

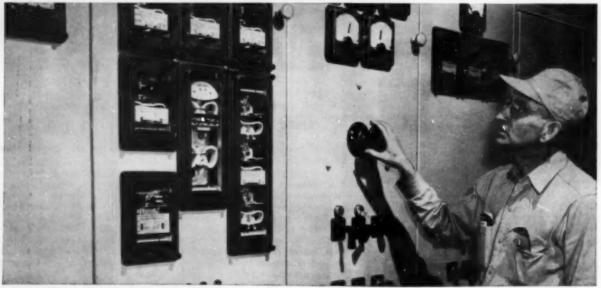
Plants at: Detroit, Michigan

Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

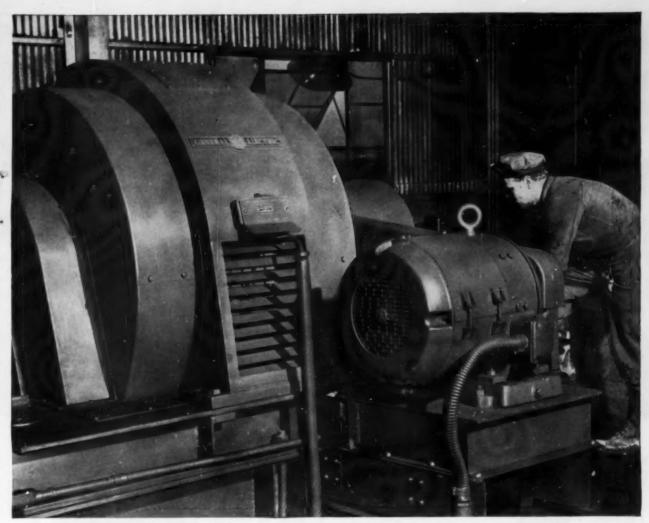




HIGHEST-LIFT CONVEYOR hauls coal up a 16-degree slope to preparation plant at C. W. & F.'s Orient No. 3 Mine. A G-E drive moves the 42-in. wide belt 625 feet per minute, handles 1200 tons per hour.



CENTRALIZED CONTROL-middle cabinet controls conveyor motor; cabinet at right controls motor when driven as generator.



EASY-TO-MAINTAIN 1500-hp synchronous motor powers belt-may also be used as diesel-driven generator for stand-by power.

Record conveyor powered by G-E drive

WORLD'S HIGHEST-LIFT SINGLE-BELT CONVEYOR is located at the Chicago, Wilmington & Franklin Coal Company's Orient No. 3 Mine in Illinois. This Link-Belt conveyor carries coal up a 16-degree slope—lifts 868 feet in one 3290-ft continuous flight. The 42-in. wide belt operates at 625 ft per min, handles 1200 tons per hour. A General Electric drive was chosen for this conveyor because: first, the reliability of the motor and control permits regulated starting and selected speed operation. Second, the synchronous

motor has important power factor correction ability, and third, G-E system engineers helped co-ordinate the drive for easy starting, minimum maintenance, greater safety.

Another factor in the selection of a G-E drive for this unusual conveyor was G.E.'s many years of experience powering more conventional conveyors. This experience is at your service. Your nearby G-E Apparatus Sales Representative can tell you more. General Electric Company, Schenectady 5, N. Y.

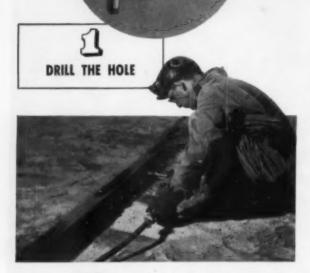
Engineered Electrical Systems for Coal Mines



Installing this Wedge-Type Tigerweld Bond

is as easy as

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 A drill and a hammer put you in business. No welding is required. No precision drilling.

You just drill a hole with an ordinary track drill. Insert the terminal and wedge. Then pound in the wedge. Three sharp blows with a 2½-lb. hammer give you a long-lasting, low-resistance bond.

A Wedge-Type Tigerweld Bond is perfect for temporary trackage. And it's so durable and reliable that many mines also use it for *permanent* trackage. Regardless of where you use it, you will find that it keeps installation costs low because it goes in so easily.

Write for complete information.





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GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS - TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S American Tigerweld Rail Bonds



UNITED STATES STEEL

Here's your Field-Proved, Mobile Cutter for very Low Vein Coal



and here's the rest of the JOY LOW VEIN TEAM

Meet the JOY 12-RB, above . . . the cutter member of the only mechanized mining team designed specifically for high-capacity production in very low vein coal. With the Joy 20-BU-1 Loader and 8-SC Shuttle Car, it assures field-proved flexibility and economy never before available to mines operating in extremely thin seams.

The 12-RB is a highly mobile and maneuverable rubbertired cutting machine only 26" high, supplied either as a top or bottom cutter, and readily convertible. Its high tramming speed and variable hydraulic feed (which provides a cutting rate up to 70 ft. per minute) together permit cutting more places per shift. Bar tilt, roll and lift are hydraulically controlled, and steering is also hydraulic, with a separate motor serving the hydraulic pump.

20-BU-1 LOADER ↑ and the 8-SC SHUTTLE CAR →

Only 24" high, yet can load up to 8 tons per minute. Fast tramming, easily maneuverable, features independently driven conveyor and gathering head. While a shuttle car is away, the gathering arms can provide a fully-loaded conveyor ready for quick loading when the car returns. Also permits continued loading even if the gathering arms are momentarily stalled with hard digging.



Features 4-wheel positive drive, 4-wheel hydraulic steering, tapered-end design for minimum turning clearance, height of only 26" and level capacity of 2 tons. Separate motors for traction, conveyor drive, and hydraulic pump drive. Disc-type brakes on all wheels, hydraulic cable reel and hydraulically-adjustable elevating discharge.

SULMET CARBIDE BITS

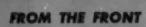
Joy Sulmet Bits, tipped with sintered tungsten carbide inserts, are made in a variety of types and different degrees of hardness to meet any mining condition. They fit any cutter, and by actual case records, out-perform every other bit on the market.

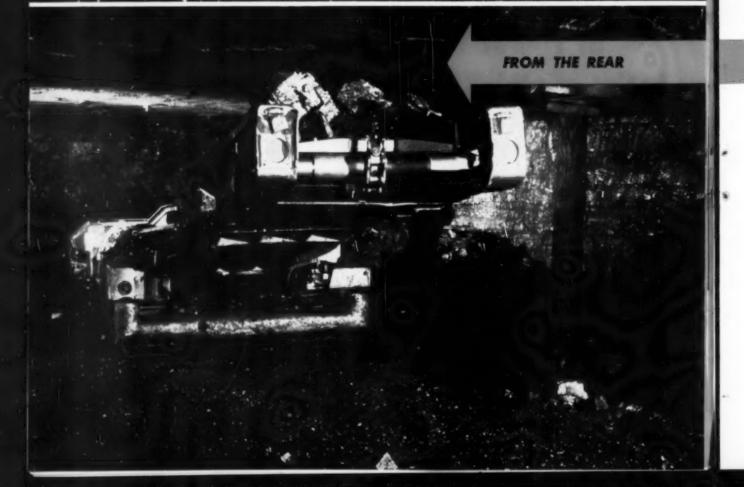


JOY MANUFACTURING COMPANY, OLIVER BLDG., PITTSBURGH 22, PA. IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

WAD CL 446





THE SUPER 14-BU LOADER

No matter how you



look

at it, or what comparisons

you make-here's the truly SUPER loader



for medium-low coal



If you'll keep in mind that the Joy 14-BU has long been the world's most widely used loader ... and that more coal is loaded by 14-BU's in medium-vein mining than by all other loaders combined—then you'll have a clearer picture of the improvements that Joy engineers have built into this year's SUPER 14-BU Loader.

Starting with the simplicity of design and unmatched durability that made the 14-BU so popular, the SUPER 14-BU is bigger, faster and more powerful than ever. Here are some of its principal advantages:

- 1. Horsepower-increased from 40 to 65 HP.
- 2. Peak Loading Capacity-20% greater.
- 3. High Tramming Speed—increased from 88 to 125 FPM.
- Mechanical and Electrical Components—all increased in size and strength to match the increased motor HP.
- 5. Machine Weight-about 900 lbs. more.

- Heights—unchanged at 30½", 33" and 36", just what the doctor ordered for mining in seams from, say, 36" to 60" thick.
- 7. Conveyor Chain Speed—increased about 30% to more than 300 FPM. Stronger Conveyor Chain, too—with 45% greater tensile strength.
- 8. Maintenance Costs—reduced by providing oversize borsepower motor, wiring and electrical contactors, etc.

Add extra advantages like those to Joy's famous gathering mechanism and exclusive Magnetax control—features that have been field-proved in every coal mining area in the world—and you have the kind of easy-operating, heavy duty, high production loader that means increased tonnage and reduced costs for you.

• Let us show you what SUPER 14-BU Loaders or other Joy Mechanized Equipment can do to improve your profit margin! Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

Consults a Goy Engineer

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

The CONTINUOUS MINER Gives You Advantages that Protect and Increase Your PROFIT MARGIN

The benefit that Joy Miners can bring you is not fancy, but fact-proved in the field by scores of JCM units working in every producing area and under all conditions from thin to full-seam

Joy Continuous Miners are fast, tough and flexible. They're built to stand up . . . and to do every job you ask of them-from the original development work to taking pillar-at the absolute minimum cost per ton. Total recovery of 80% or better is common, and in some cases exceeds 90%. Why not look into it? Our engineers are at your command, any time! . Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

Maximum Total Recovery

Favorable Size Consist

★ Stay-on-the-Job Toughness

* Reck-bottom Cost per Ton

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT



Time for another look at your trackwork?

As you know only too well, the cost of mining has been steadily inching up on the price you get for coal. No doubt you've turned to a modernization program to help solve this problem. Heavier locomotives, larger-capacity cars, mechanical cutting and loading equipment . . . these all tend to boost production efficiency, thus reducing costs.

Now, what about your trackwork? Can it stand the gaff of this new and heavier equipment?

Right now is a good time to ask yourself that question. Or, if in doubt, ask a Bethlehem mine track engineer. Bethlehem engineers have had long experience in mine trackwork, and are well equipped to help you. They'll visit your properties, analyze your problems with you, and recommend the trackwork needed to keep your system years ahead.

If you wish, they will design a complete new layout, or re-design your present one to meet your operating conditions. They'll figure necessary rail weights, tie-spacing, turnouts and crossings, then furnish the materials cut, precurved and prefitted to exact specifications, every last nut and bolt included.

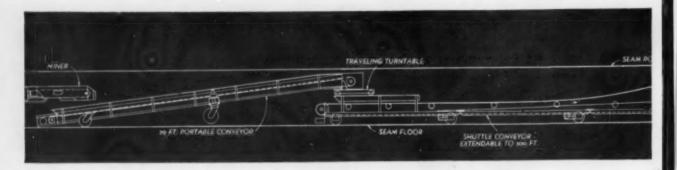
Bethlehem Prefabricated Track is not in the luxury class. Many mines have found that a Bethlehem layout actually costs less in the long run than if they had done the job themselves. A session with one of our men will show you what you can expect. Just call or write the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Expor



BETHLEHEM PREFABRICATED TRACK



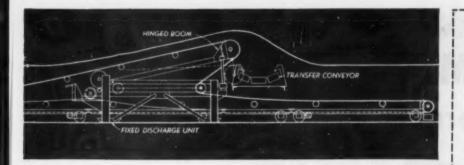
Here's the New Answer to





HEWITT-ROBINS

EXECUTIVE OFFICES, STAMFORD, CONNECTICUT



Continuous Mining



It's The Hewitt-Robins Mine Type Shuttle Conveyor With Fixed Tripper

The Hewitt-Robins Mine Type Shuttle Conveyor with fixed tripper forms the final link in a complete belt conveyor system that can handle an uninterrupted flow of coal directly from the face to preparation plant as fast as any mechanism can produce it.

This versatile unit is the key to truly continuous mining. The Shuttle Conveyor is both extendable and retractable—can follow the progress of mining and at the same time maintain a fixed transfer point through a fixed tripper and is extendable to 600 or 700 feet.

As the working face advances, the Shuttle Conveyor can closely follow the mining machine and receive its load either directly or from an intermediate transportation unit such as shuttle car or loading machine. The Shuttle Conveyor is so designed that alignment can be properly maintained by mounting small guide rollers on standard roof-jacks along each side of the conveyor frame, when operating off-track. When track-mounted, the guides are not required.

Remember, when it comes to any type of belt conveyor, or complete belt conveyor systems, only one company—Hewitt-Robins—can assume single and unified responsibility for successful operation. For only Hewitt-Robins designs, engineers, manufactures and installs both the belt and machinery.

Here is a partial list of

HEWITT-ROBINS PRODUCTS

that will help you cut handling costs and increase operating efficiency.

MACHINERY

Belt Conveyors
Belt & Bucket Elevators
Car Shakeouts
Conveyor Idlers
Dewaterizers
Mechanical Feeders
Foundry Shakeouts
Mine Conveyors
Reclaiming Systems
Screen Cloth
Stackers & Trippers
Vibrating Conveyors & Screens

INDUSTRIAL RUBBER PRODUCTS

BELTING:

Conveyor Elevator Transmission

HOSE:

Arid Air & Air Drill Barge Loading **Dust Suction** Fire Fuel Oil & Gasoline Gasoline Pump **Mud Pump Suction** Oil Suction & Discharge Propane-Butane Road Builders' **Rotary Drilling** Sand Blast Sand Suction Sea Loading Servall®, All-Service Tank Car & Tank Truck Vacuum & Air Brake Water & Water Suction Welding, Twin-Weld®

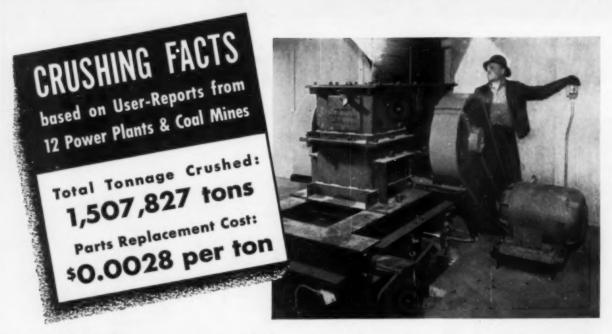
For information and service on industrial rubber products, contact your Hewitt-Robins Industrial Supply Distributor. Through his complete stock of Hewitt-Robins Rubber products, and his familiarity with local field conditions, he can fill your supply needs promptly and correctly. See Classified Phone Book for the Hewitt-Robins Industrial Supply Distributor serving your

INCORPORATED

DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • EXPORT DEPARTMENT: New York City

Actual Figures...NOT Claims

Prove that AMERICAN "WC" coal crushers are top performers at low operating costs!



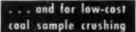
When the actual tonnage figures (as supplied by the Chief Engineers of power plants and the Preparation Engineers of coal mines) are compared with the total cost of replacement parts ordered, the real story of the quality and efficiency of American "WC" Coal Crushers is apparent—the story given in the panel above.

With American, quality is not a mere claim, nor even an isolated performance story. It is based on the consistent pattern of high-tonnage-at-low-maintenance

for all types of American coal crushers—a record directly traceable to the efficient crushing action of the American-originated rolling-ring crushing principle, plus a half century of specialized experience in building coal crushers.

American "WC's" are designed for capacities up to 90 tons per hour... but whether your requirements range from coal sampling up to 600 tons or more per hour, American has the crusher to handle your job at the lowest possible cost.

WRITE FOR COMPLETE INFORMATION AND LITERATURE



Model 9-9 American Laboratory Crusher, one of several sizes for reducing coal samples prior to analysis.





Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Ave., Saint Louis 10, Mo.

How TIMKEN® bearings help miners commute in comfort

HIS Brown-Fayro Man-Car whisks miners to and from the mine face as smoothly as a commuter's special. No wonder. Its wheels roll on Timken® tapered roller bearings.

Over 500,000 coal-hauling cars roll on Timken bearings, too. Timken bearings cut costs because they:

1. TAKE GREATER SHOCK LOADS. Made of Timken fine alloy steel-case hardened to provide a hard, wear-resistant surface over a tough, shock-resistant core-Timken bearings can take the pounding a mine car gets.

2. INCREASE CAPACITY. Since loads are carried on a line of contact between rollers and races, Timken bearings have extra capacity.

3. MAKE STARTING EASIER, PERMIT LONGER TRAINS. Timken bearings' true rolling motion and smooth surface finish practically eliminate friction.

4. SAVE LUBRICANT. Timken bearings keep housings and shafts concentric, make closures more effective. Lubricant stays in-dirt and moisture

5. SIMPLIFY INSPECTION. Wheel mount-

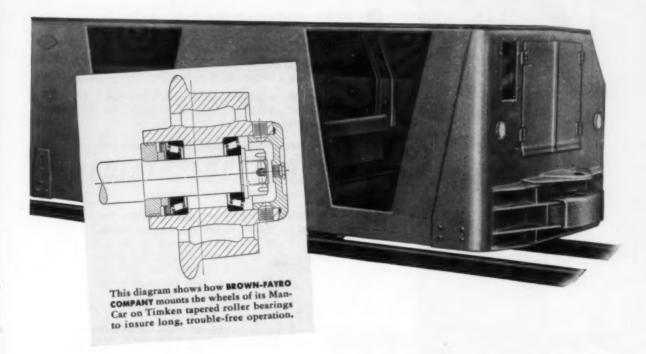
ings are simpler, you just pull cap, cotter pin and nut to inspect.

6. ELIMINATE SPECIAL THRUST PLATES. Timken bearings' tapered construction takes radial and thrust loads in any combination. Cars take curves easier.

Put these advantages to work for you. Specify Timken bearings in the mining cars you build or buy. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.





TAPERED ROLLER BEARINGS



WE MAKE OUR OWN STEEL

The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Com-The Timken Roller Bearing Com-pany is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality con-trol; 4. special analysis steels.

NOT JUST A BALL ONOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST - O-LOADS OR ANY COMBINATION



CUTS FASTER LASTS LONGER

CARBOLOY

CEMENTED CARBIDE

6 REASONS WHY CARBOLOY **CUTTER-BIT FEATURES LOWER** YOUR TOOL COST PER TON:

- Carbide insert stays in place because it's held by a unique combination of braze and mechanical holding.
- Less power is consumed because point has smaller radius; does a better job of cutting.
- Less carbide to grind because there's less nonworking top and side area. Resharpens faster, conserves carbide.
- Carbide has greater strength because insert has 50% greater thickness at the cutting edge.
- Cuttings flow freely because shank is level with carbide insert. "Bug dust" is minimized.
- Shanks resist bending because they're heat-treated alloy steel . . . yet permit firm set screw clamping.

24

CCS-2

134"

Has 1%" stop - the size picked by the industry as most practical.

CC-2

The CC-2 has all the important features listed above. Available for those who prefer a cutter bit without a stop.

SPECIFY CARBOLOY MINING

heavy-duty cutter bits available with or without stop

All the improved design features of the popular Carboloy CC-2 heavy-duty cutter bit are incorporated into the CCS-2 — with a practical 134" stop.

The high-speed efficiency and substantial operating savings which made the CC-2 first choice in the mining industry, will also be obtained with the CCS-2.

Choose the bit that's right for your operation.

Use the Carboloy CCS-2 for all cutting machines, including continuous miners. Its 13/4" stop is the industry's choice for the right combination of efficient cutting depth and minimum shank

Use the Carboloy CC-2 for all cutting conditions not requiring a stop. Can be used on all machines that employ 1/2" and 1" bits. Set it to any gauge size. Use it on the toughest formations.

All Carboloy Mining Tools are made of the hardest metal made by man-Carboloy Cemented Carbide. They work continuously, at faster speeds, and for longer periods than steel tools. Actual mine tests prove that Carboloy Mining Tools consistently outlast steel by up to 50 times; increase tonnage 10% to 20% per shift.

Get maximum tonnage and efficiency from your carbide tools by using the Carboloy 3-Point Service Program. It consists of tuition-free training school for key personnel, free technical literature and free engineering field assistance. To get complete information, call your Authorized Carboloy Mining Tool Distributor. Or, send coupon, below.

IMMEDIATE LOCAL DELIVERY

Twenty Authorized Carboloy Mining Tool Distributors, strategically located across the nation's mining areas, will give you fast delivery on all orders. They maintain complete stocks of Cutter Bits, Finger Bits, Auger Drills, Roof-Bolting Drills and Masonry Drills. Their men are specially trained in carbide-tool use and maintenance techniques.



"Carbolay" is the trademark for products of the Carbolay Department of General Electric Compa

11120 E. 8 Mile Ave., Detroit 32, Michigan

Send me the following, without cost or obligation:

- ☐ Catalog supplement on CCS-2 Cutter Bit CM-113
- Catalog and Maintenance Instruction Manual CM-110
- Data on tuition-free Customer
 Call by a Field Representative Data on tuition-free Customer Training School

Position

Address



important Dumptor advantages

Take another look at the latest model Koehring 6-yard Dumptor shown here. It has some important features worth checking. Notice how heavy snubber-spring on steering axle cushions road shocks—yet retains Dumptor's unique advantage of no spring maintenance. There are no leaf springs. Big shock-absorbing drive tires eliminate need for springs on the drive axle.

Alignment of drive wheels with steering wheels adds to efficiency of Dumptor no-turn shuttle hauling — makes a big difference in traction and flotation when Dumptor is shuttling back and forth across loose stockpiles, soft ground.

Another basic Dumptor advantage is instant gravity dump. It's controlled by a simple body latch and new dump lever arrangement. Gravity dumping eliminates slow-acting, troublesome body hoists — never balks, never wears out. Notice, too, the new streamlined, all-steel body. Even with all this heavy-duty strength, Dumptor still has more than 6 h.p. for every ton of loaded weight. It accelerates fast, pulls through soft ground and up grades with less shifting — climbs 24% grades fully loaded.

Let your Koehring Distributor give you all the latest Dumptor® facts. See him soon, or write.

KOEHRING COMPANY

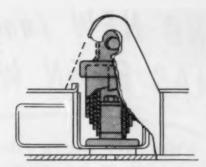
MILWAUKEE 16, WISCONSIN



Subsidiaries: PARSONS KWIK-MIX • JOHNSON

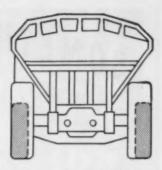
K437





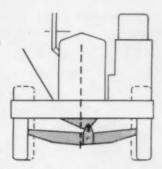
Smooth ride

Heavy, snubber-type spring is mounted between Dumptor main frame and the steering axle. Shock-absorbing action provides plenty of "cushion" — takes all the jolts out of rough, off-road travel. Easy on operator and machine.



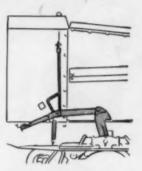
Tires track in direct line

Wider, heavier steering axle puts Dumptor steering wheels in direct line with big drive wheels. Tires track in the same path. There's less rolling resistance, better traction in soft ground, and on rough haul roads.



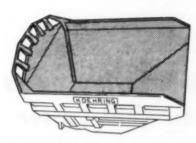
Off-set pivot on axle

Pivot point on steering axle is off-set from center line 3½" toward operator side of machine. There's no sag, even with unbalanced load. Steering axle oscillates up to 21" — keeps twisting strains out of Dumptor main frame.



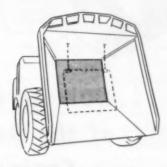
New body-latch, dump lever

Body latch for 1-second gravity dumping is simple, trouble-free. Latch is engaged by a single hook, mounted on the chassis frame. Dump lever is located inside the cab, in an easyreach position to left of operator.



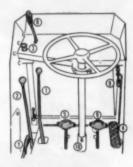
Streamlined, all-steel body

Inside is free of bulges or ledges. Top edge is box-beam constructed. Sides, ends are ribbed with 5 and 8" channels. Double-plate bottom is lined with multiple steel beams. Note ridge bar added to sturdy rock-guard teeth.



Bolted or free-swinging pan

Heavy steel kick-out pan is ½" thick. Pan can be bolted to body floor for extra protection when loading rock. Remove bolts, and pan has free swinging kick-out action — breaks suction when dumping wet or sticky materials.



Easy-reach controls:

(1) Speed gear shift lever, (2) directional gear shift lever, (3) starting aid, (4) foot throttle, (5) clutch pedal, (6) brake pedal, (7) parking brake, (8) body-release lever, (9) hand throttle, (10) running lights control switch.

SOMETHING NEW (and better) HAS BEEN WELDED!

THIS BIT CARRYING BODY ... FORMERLY CAST ALLOY STEEL BOWDIL BITS DROP-FORGED! securely welded to chain SET SCREW LOCKS BIT LARGE HOLDER HEAT-TREATED PINS DROP-FORGED INGENIOUS TRACK LINK AND RIVET GUIDES CONNECTOR LOCK HEAVY-WALL HARDENED BUSHING NOW all the wearing parts MADE BY THE MAKERS of the Bowdil Coal Cutter OF THE .. Chain are Drop-Forged! STRONGEST CUTTER BAR IN THE COAL INDUSTRY

CANTON 7, OHIO



Overheated motors, reduced production, machine slowdown, and increased maintenance are all part of the penalty you pay for excessive voltage drop in your low voltage feeder system. How can you prevent these costly delays and increase production? By keeping your motor generator sets or other conversion equipment as close to the face as practicable, thus keeping your low voltage feeders as short as possible.

This means that your high voltage cables will extend underground close to the face. For this kind of service you will need as good high voltage feeders as there are available, and that means Simplex-ANHYDREX XX Cables.

Simplex-ANHYDREX XX Cables have unusually high resistance to water-absorption, heat, ozone, and aging. They are easy to install and easy to take down. These features mean cable reliability, increased production, and lowered operating costs for you.

Why don't you investigate the possibilities of running your high voltage feeders underground and keeping your conversion equipment close to the face?

face. For this kind of service you will equipment close to the face?

WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 Sidney St., Cambridge 39, Mass.

You Get Higher Overall Output, Lower Overall Costs...

with Bucyrus-Erie Individual Design



Strength without excessive weight, ample power without wasted horsepower, maximum speed, top efficiency — all that adds up to higher overall output at lower overall costs is yours with Bucyrus-Erie excavators because they're built right for their work.

Each model is individually designed with just the right combination of power, strength, and weight to do the job of handling its rated load. That means low maintenance, too, because no parts are overstressed and there is no excessive wear.

Individual design is just one of many reasons why
Bucyrus-Erie excavators have gained a reputation for
top coal loading output. You can get the full
Bucyrus-Erie performance story from your nearby
Bucyrus-Erie distributor.

4253

BUCYRUS-ERIE COMPANY

South Milwauker Wisconsin

Positive protection against profit loss-when you use Sterling CAST STEEL WHEELS



Sterling's exclusive balanced design cast steel wheels reduce vibration, prevent costly wear and tear on tracks and cars alike.

GREATER MILEAGE, LOWER OPERATING COSTS

Sterling cast *steel* wheels are precision engineered to give you far smoother transportation, greater mileage at less cost.

LOWER REPLACEMENT COST

Although Sterling cast steel wheels cost more than other types your replacement cost is actually lowered when you use the moneysaving Sterling re-wheeling plan.

LESS DOWN TIME: REDUCED LABOR COST

Sterling cast steel wheels work-harden with each trip. This extreme hardness is uniform throughout tread and flange, assuring much longer life than other type wheels.



Transportation breakdowns can not only be expensive, but hazardous. A crushed wheel, derailed cars, a smashed locomotive can take the profit out of any mining operation. That's why STERLING STEEL CASTING COMPANY developed the exclusive balanced-design cast steel wheel, an engineering masterpiece that is your best assurance for dependable, low maintenance, trouble-free transportation. Aside from the great safety factor, in the long run Sterling cast steel wheels actually cost you less than any other type of wheel on the market today.

For complete information on the Sterling Plan, a time-tested program for re-wheeling that will put you dollars ahead for years to come...

mail this coupon today!

Sterling COMPANY EAST ST. LOUIS . ILLINOIS

REPRESENTATIVES:

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WHEELING, W. VA. Service Supply Co. James Squib Hawley Building STERLING STEEL CASTING COMPANY
East St. Louis, Illinois

Please send complete information on the STERLING CAST-STEEL WHEEL REPLACEMENT PLAN to me immediately.

Vame...

Company

Address

State.



It's a good thing for you that Mrs. MacTavish was on the school board

The plans for the new school building were all completed and were now being shown to the Board.

"And why," asked Mrs. Mac-Tavish, "should the new building burn oil instead of coal?" "Well," explained the architect

very patiently, "oil saves labor."

"So does a stoker!" snapped Mrs.

MacTavish.

"And oil is clean."

"No cleaner than coal if you use the right grade and burn it right. What's more, you can always get coal and maybe you can't get oil. Remember how the schools over at Jamestown had to shut down for weeks at a time during the war because they couldn't get oil?"

"Anything else, Mrs. MacT?"

"Indeed there is. I always save my big reason till the last. Coal's a sight cheaper."

"Oh now, Mrs. MacT., I don't think there is so much difference."

"When it comes to spending money, I don't want to think—I want to know. The Chesapeake and Ohio Railway has a combustion engineering service—absolutely free, mind you. Let's get their man to come in and give us facts—not opinions."

The C&O combustion engineer's carefully documented survey proved beyond doubt that coal

would not only save several thousand dollars a year in fuel cost, but that the installation itself would be cheaper.

"There should be a Scot on every civic board," snapped Mrs. Mac-Tavish. "We're the only people left who seem to care a hoot about the taxpayer's pocketbook."

Bring your fuel problems

As the world's largest carrier of bituminous coal, the C&O is intimately familiar with every phase of coal use. We have a large starf of experts who best suited to your needs; to help you to locate the coal use it most efficiently; to help get it

Write to:
Coal Traffic Department
Chesapeake and Ohio Railway
2119 Terminal Tower
Cleveland I, Ohio

Chesapeake and Ohio Railway



COAL ... FUEL OF THE FUTURE



ACCESSIBLE DILOR SERVICE

- ALL MAINTENANCE POINTS ARE EASY TO REACH.
- DOWN AND RE-TURNED TO SERVICE IN LESS THAN A HALF HOUR.
- MANY PARTS INTER-CHANGEABLE BE-TWEEN DIFFERENT PUMP SIZES.

Coal Washing
PUMP

Here's How Easy Service Is



Disconnect drive, loosen casing bolts and lift bolt assembly from slots. Bolt, nut and washers are still connected for easy reassembly.

Swing out rotating element. Neither suction or discharge piping is disturbed. All wearing parts are fully accessible for inspection or service.



FOR HELP ON YOUR COAL WASHING PROBLEMS, call your nearest Allis-Chalmers District Office. For more information, write Allis-Chalmers, Milwaukee 1, Wisconsin for Bulletin 52B6381.

ALLIS-CHALMERS



vibrating equipment



FIFFRE

IF IT'S MINED, PROCESSED OR MOVED
...IT'S A JOB FOR JEFFREY!

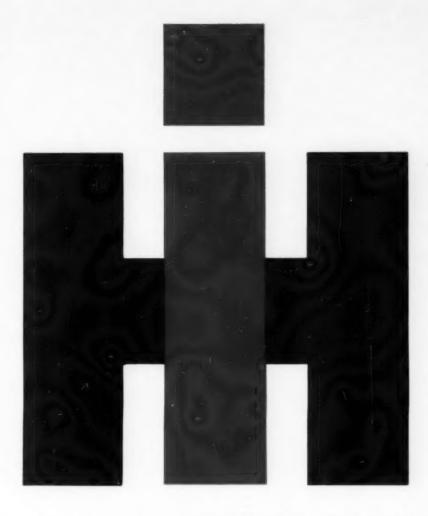
MANUFACTURING

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

CO.

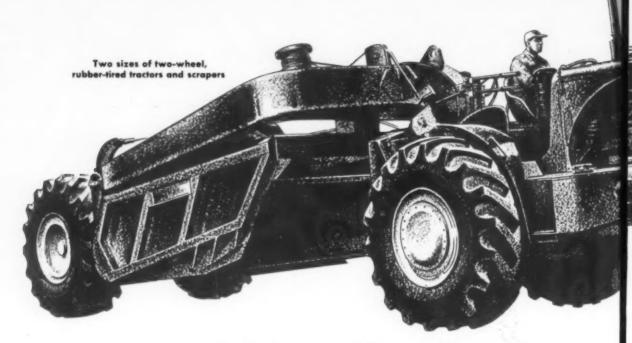


International Harvester and INTERNATIONAL Industrial Distributors present a complete line of modern earthmoving equipment, led by the INTERNATIONAL two-wheel, rubber-tired tractors with scrapers, and by "Big Red," the INTERNATIONAL TD-24, world's most powerful crawler

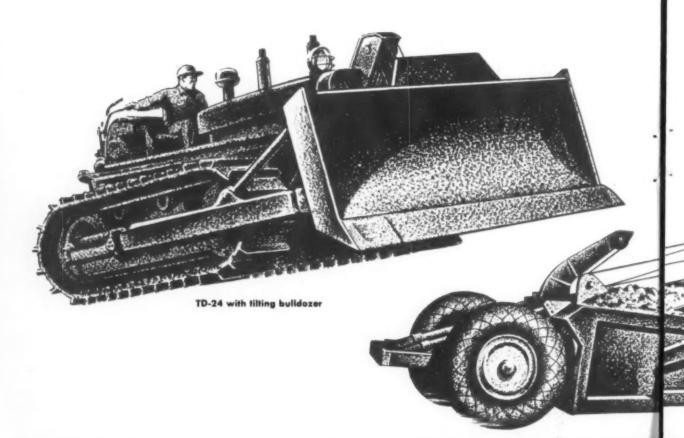


INTERNATIONAL

POWER TO MOVE THE EARTH



Now a complete earthmoving line that comes in the





Big Red Package

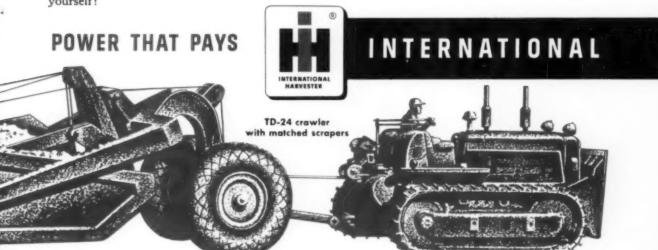
Got a big job to do? Call on INTERNATIONAL'S new Big Red Team!

- Seven rugged crawlers headed by the TD-24—most powerful crawler on the market!
- Twenty-two matching hydraulic and cablecontrolled bulldozers and bullgraders, with land-clearing blades available!
- Four 4-wheeled scrapers!

- Two high-speed, two-wheel, rubber-tired tractors with scrapers (13 and 18 heapedyard capacity)!
- A high-speed, two-wheel, rubber-tired tractor with bottom dump wagon (20 heaped-yard capacity)!

These great machines, now grouped under the INTERNATIONAL banner, have proved their dependability and economy to contractors for years on big projects around the world.

Your INTERNATIONAL Industrial Distributor has the equipment that will help you make a profit on any job you tackle. Call him for full details . . . or for actual demonstrations. See for yourself!



Now All in One Family

the hardest-working work teams in the world!

The new INTERNATIONAL team stars not only a full line of rugged red INTERNATIONAL crawlers, complete with INTERNATIONAL scrapers and bulldozers, but also high-speed INTERNATIONAL two-wheel, rubber-tired tractors with scrapers.

This means that now, more than ever, your INTERNATIONAL Industrial Distributor is "Earthmoving Headquarters" for your area. He offers you IH equipment to tackle any job, backed up by unsurpassed service facilities and parts supplies.

He's at your call, always, to help keep your equipment rolling . . . to cut down your downtime and pile up your profit-time . . . to serve you with INTERNATIONAL "Power that Pays!"

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



INTERNATIONAL

POWER THAT PAYS



TD-24 crawler with matched scrapers



TD-18A crawler with matched scrapers



TD-24 crawler with builgrader



TD-14A crawler with cable bullgrader



TD-9 crawler with hydraulic bulldozer



T-9 crawler with hydraulic bullgrader



TD-6 crawler with hydraulic bulldozer



T-6 crawler with hydraulic bullgrader



Model 2T-75 two-wheel, rubber-tired tractor with 18 heaped-yard capacity scraper

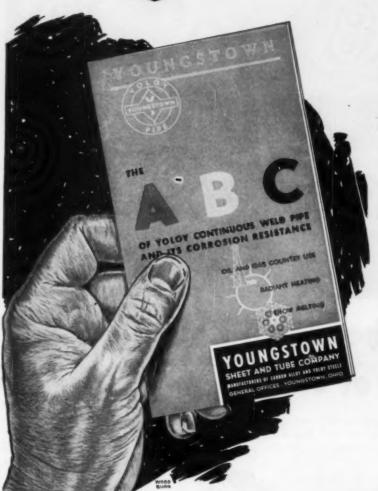


Model 2T-75 two-wheel, rubber-tired tractor with 20 heaped-yard capacity bottom dump wagon



Model 2T-55 two-wheel, rubber-tired tractor with 13 heaped-yard capacity scraper

This DATA may solve YOUR piping problem



• Here is the up-to-date story of Yoloy Continuous Weld Pipe-a remarkable low alloy steel whose nickel-copper content gives it unique ability to withstand corrosion, abrasion and shock. These outstanding advantages combined with high strength, ductility and weldability make Yoloy Pipe an excellent selec-

Proved by 18 years of satisfactory performance, Yoloy is highly recommended by users in such service as radiant heating, snow melting, gas line gathering, brine lines and other industrial piping.

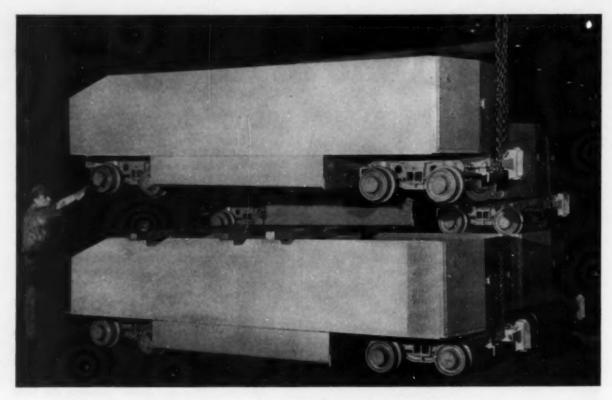
This new folder presents the facts and figures on Yoloy's physical and chemical properties, with data on sizes now available and other information you'll need to select Yoloy Continuous Weld Pipe to meet your special requirements. Write for a copy today.

YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yolov Steel COLD FINISHED CARBON AND ALLOY BARS - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS -SHEETS

General Offices Youngstown 1, Ohio

Export Office-500 Fifth Avenue, New York BARS - RAILROAD TRACK SPIKES.



A Fleet of These Will Haul a Lot of Coal

These shiny, brand-new Bethlehem cars are part of a fleet for a high-production bituminous mine. It's a fleet that will haul a lot of coal, for the cars are of high capacity—10 tons each. What's more, they are built to last for many years.

The all-steel, all-welded bodies are brutes for punishment. Ten-ton loads won't bother them. The running-gear is sturdy, too—eight forged wheels per car, and cast-steel trucks with extra-heavy springs.

This model is but one of the many in Bethlehem's large family of mine cars.
Whatever suits your own particular needs, Bethlehem will build for you—eight-wheelers,

four-wheelers, end-dump, rotary-dump, high-side, low-side.
The various models differ greatly in size and style, but they all have one common point—they are made for the most severe pounding you can give them.

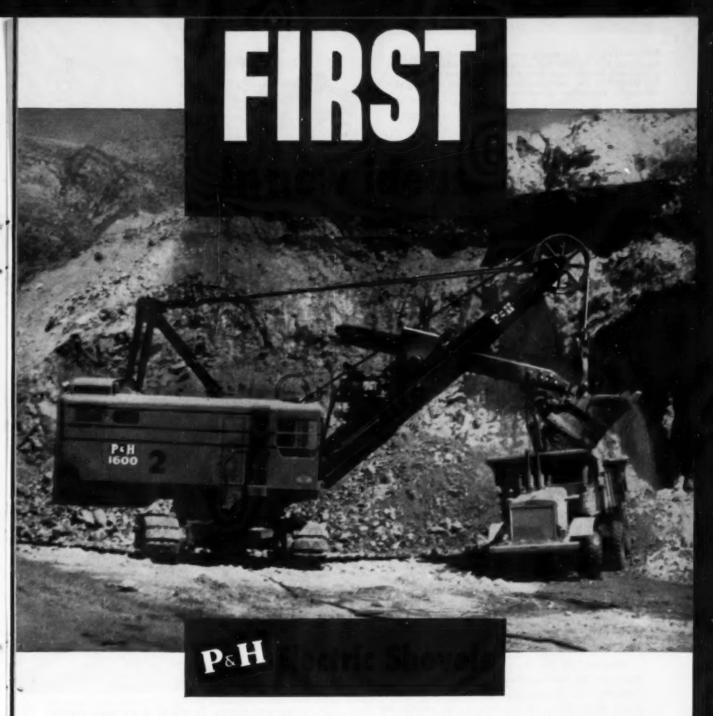
Call or write us the next time you're considering additions to your fleet. Our engineers will gladly help you design your cars, and our shops will build them to specifications—durable cars that will serve you well.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.



On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation





The first thing you see when you look into P&H Electric Shovels is new ideas—ways of doing things differently. Differently and better! For P&H engineering concentrates on one thing . . . cutting your production costs!

The result is evident in electrical equipment designed and built by P&H—especially for the purpose—not adapted for it. Step-less power regulation gives you the smoother flow of power without multiple contactors to cause trouble and replacements. There's Magnetorque* Hoist Drive, vertical swing motors, independent propel, powerful worm crowding mechanism with separate crowd motor, air-filtered cab. And there's the allwelded strength of rolled alloy steels to take year-in, yearout punishment.

P&H leadership in electric shovel development gives you leadership in all kinds of open pit work . . . lower tonnage costs! That explains why every third P&H Electric Shovel sold is a repeat order. Get the facts.

*T. M. of Harnischfeger Corporation for electro-magnetic type coupling.

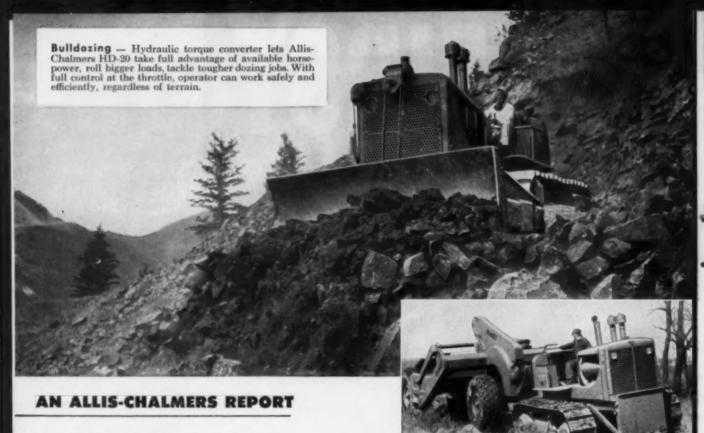
P.H LARGE EXCAVATOR DIVISION HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN









How hydraulic torque converter drive improves big tractor performance increases job output

With a two-range transmission and hydraulic torque converter, the Allis-Chalmers HD-20 is the only crawler tractor that is capable of exerting maximum drawbar pull at all times . . . under all load and terrain conditions . . . without gear-shift guesswork.

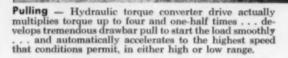
Whatever the job, the operator need merely make contact with the load and then open the throttle. As the load requirements change, the hydraulic torque converter automatically matches the conditions with exactly the right combination of speed and pull.

This eliminates most shifting...leads to far more work done in a continuous work cycle... far longer equipment life.

Hydraulic torque converter drive, exclusive as standard equipment with Allis-Chalmers, is just one of many reasons why the HD-20 assures you higher output with less up-keep. Your nearby Allis-Chalmers dealer invites you to get the full story . . . and to see it in action.

WEIGHT - 41,000 LB. . 175 NET HP. AT FLYWHEEL

ALLIS-CHALMERS





Pushing — Operator just makes contact, then opens the throttle and relaxes. The HD-20 automatically matches speed to that of pushed equipment, maintains steady contact while loading, sends load off to the fill at higher speed.

Digging and Loading — With the HD-20G, the operator crowds surely and steadily, using only throttle and bucket levers. With full horsepower always available even at creeping speed, he can work effectively in mud, on hillsides or edges of banks.





AMOCO Leaded Lubricants

Provide Safer, Surer Gear Protection

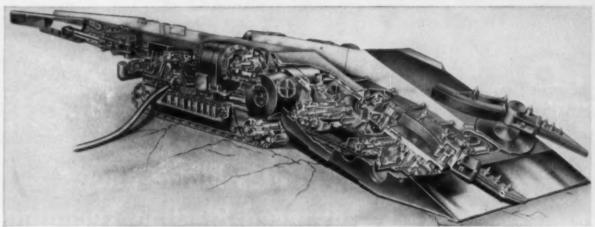


PHOTO COURTESY JOY MFG. CO.

Unusual extreme pressure characteristics and extra oiliness qualities, plus ease of handling at low temperatures, make Amoco Leaded Lubricants a favorite in many mine operations. Recommended for universal joints and gear cases of loading machines, shuttle car wheel units, worm gear speed reducers, heads and gear cases of mining machines, open gears, and many other applications. Another great by Amoco!

AMOCO UBRICANTS FOR MINE MACHINERY

AMERICAN OIL COMPANY . FROM MAINE TO FLORIDA



office listed at right or to our home office. Let us know approximately when you will want it, the type of meeting you are planning and we will be glad to work out the arrangements at no cost to you.

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ATLAS EXPLOSIVES

"Everything for Blasting"

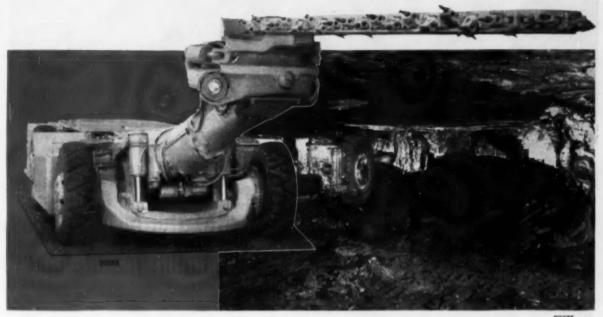
ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE Offices in principal cities

It moves anywhere in the mine . . . It cuts anywhere in the seam

the Goodman

ALL-PURPOSE COAL CUTTER

- Top cuts
- Center cuts
- Bottom cuts
- Shears



The type "2400" bottom cutting a room neck. Bugduster automatically handles cuttings.

The Goodman Universal Cutter is built for varied application, productive performance and hard serv-

Available in two heights: Low —Type 2400, 30" to 34" High—Type 2410, 40½" to 44"

The Goodman rubber-tired universal cutter is fully described in Catalog No. 531. Let us send you a copy now.



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Conveyors

ice at reasonable upkeep cost. It's the ideal working

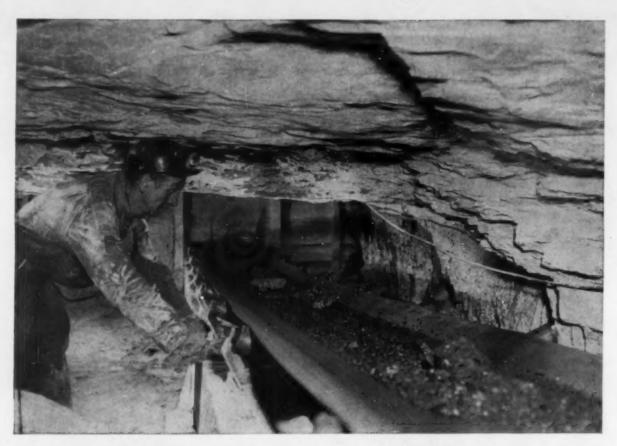
mate for Goodman Loaders and Shuttle Cars.

Loaders

Shuttle Cars

Lecomotives

Continuous Miners



Buchanan County Coal Co. reports: 1600-ft. belt reinforced with "Cordura" handles 16-hour-per-day production with minimum maintenance



View of belt reinforced with "Cordura" at discharge end. One motor is all that is required to move entire mine production to loading point. Operators report a great increase of efficiency over the old method of mine-car loading. Operating continuously for 16 hours per day, the conveyor belt shown above carries coal and bituminous by-products from the face of the mine to the mine cars. The belt, manufactured by Raybestos-Manhattan, Inc., gets its stretch-free strength from Cordura* reinforcement. Although the belt line is level, at times the floor is raised in places, putting great stress on the belt. Operators of the Buchanan County Coal Company, Big Rock, Va., report, however, that the conveyor belt reinforced with "Cordura" has stood the strain without trouble. It has been in service over four years, requiring practically no maintenance.

Engineers report better troughing and training when belts are sinewed for strength with Du Pont "Cordura". And the low stretch of "Cordura" means less downtime for take-ups, resplicing. Loaded or empty, these belts ride firmly on the center idler.

Find out more about the advantages of belts reinforced with "Cordura". Write for names of suppliers, and for your copy of the free booklet: "Sinews for Industry". Address: Textile Fibers Dept., Room 2528-C, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

* REG. U.S. PAT. OFF.

Du Pont "Cordura" High Tenacity Rayon

Watch "CAVALCADE OF AMERICA" on Television.

QUPONT

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

He Knows!

EXPERIENCE is the truest guide to production efficiency and economy... and experience throughout the mining industry proves that Roebling wire rope is your one top choice for avoiding delays, cutting down replacements and saving wire rope dollars.

All over the country, large numbers of experienced wire rope users definitely prefer Roebling wire rope. Call your nearest Roebling office or distributor for a Roebling recommendation.





JOHN A. ROESLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. . BOSTON, SI SLEEPER ST. . CHICAGO, 5835 W. ROOSE-VELT RD. . CINCINNATI, 3333 FREDONIA AVE. . SLEVELAND, 13335 LAKEWOOD MEIGHTS BLVD. . DENVER, 4801 JACKSON ST. . DETROIT, 912 FISHER BLDS. . HOUSTON, 6216 MAVIGATION BLVD. . LOB ANGELES, 5340 E. HARBOR ST. . NEW YORK, 19 RECTOR ST. . GOEBBA, TEXAS, 1920 E. 3HD ST. . PHILA-DELPHIA, 230 VINE ST. . SAN FRANCISCO, 1740 177H ST. . SEATTLE, 900 18T AVE. B. . YULSA, 321 N. CHEYENNE ST. . EXPORT SALES OFFICE, TRENTON Z, N. J.

The Only Rotary Blast Hole Drill Capable of Drilling 124-in. Holes

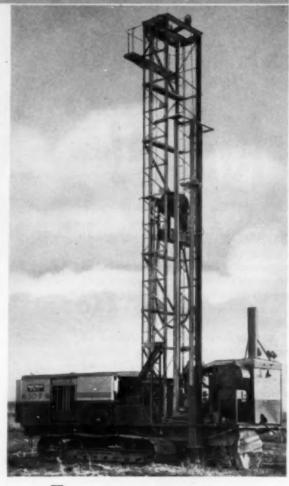
The Bucyrus-Erie 50-72

Now, you can take full advantage of the large hole drilling technique with a rotary drill too—the Bucyrus-Erie 50-R. Here's a machine, designed to drill 97/8 to 121/4-in. holes, which has proved its ability to drill these large diameter holes in the shortest time possible.

For example, a 50-R, operating on 63/4 hour shifts in a large Indiana open pit coal mine, drilled 2,598 holes of 105/8-in. diameter to an average depth of 42 ft. in six months. The average drilling rate was 125.1 feet per hour for a total of 844.4 feet per shift. Overburden consisted of medium hard sandstone with an overlay of hard shale.

Look Over These Important 50-R Features

- Down pressure on the bit is hydraulically powered for maximum controlled penetration.
- 2 Ward Leonard electric control on rotation of drill pipe permits drilling at most efficient speed for a given formation.
- 3 Drills continuously for 32'-8" before an additional drill pipe section is added.
- 4 Drill pipe sections are added or removed in a few minutes with a remote-controlled, power-driven tool handling unit. No heavy manual labor is involved.
- 5 Cuttings are removed from the hole as drilling progresses by two 640-cfm air compressors. Only the "fines" are picked up and handled by the Roto-Clone precipitator. "Heavies" pile up adjacent to the drill hole for use as stemming material.



There are many more reasons why the 50-R is the finest rotary blast hole drill ever built. Write for complete information today on how the 50-R can save you money in your mine or quarry.



South Milwaukee, Wisconsin



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Below: An Eimco single disc pilat model filter is available on rental or lease basis to test the dewatering of your fine coal products in your own plant. Eimco filters used in dewatering coal fines have been selected by most progressive companies because: (1) Eimco offers the only reliable, heavy-duty unit for the job that is simple and free of trouble making gadgets. (2) Eimcos will operate continuously with a minimum of attention. (3) Cakes on Eimco filters are smooth and uniformly dried over the entire surface. (4) More tonnage is filtered per square foot per hour. (5) Eimco discs and Agidisc occupy less floor space per foot of filter area. (6) Better filter bag life, and many other advantages.

Copies are still available of the paper "Economic Dewatering of Coal," by Silverblatt & Dahlstrom, presented at 1953 Joint Fuels Conference sponsored by Coal Div. A. I. M. E.

THE EIMCO CORPORATION

Salt Lake City, Utah, U.S.A.

Expect Office Fines Ridg. 52 South St. New York City

You Can't Beat An Eimeo

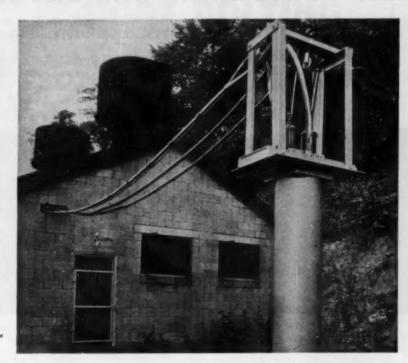


Down come costs.....

with U. S. aluminum borehole cable

Insulated aluminum cable costs less than copper cable and far less than armored copper cable. Aluminum needs no supporting armor because it can easily support its own light weight in boreholes of great depth. A 500,000 CM insulated aluminum cable is less than half the weight of an identical copper cable. It is furthermore easier to handle and its light weight speeds up every operation connected with its installation. It also makes possible fewer, simpler lower-cost supports.

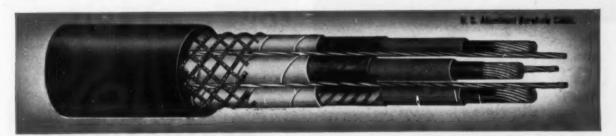
United States Rubber Company is the only manufacturer of wire and cable that grows its own natural rubber and makes its own synthetic rubber and plastics. This quality control means the ultimate in electrical insulation.



COMPARISON OF THE CURRENT-CARRYING CAPACITY, WEIGHT AND RESISTANCE OF SELECTED COPPER AND ALUMINUM TIRES AND CABLES

	Open-Air Current- Currying Capacity Amperes		Weight Per 1,000 Ft., Pounds		Resistance 1,000 Ft., 25 Deg. C Ohms	
	R Copper	BH Aluminum	R Copper	RH Aluminum	Copper	Aluminum
2/0	225	222	541	274	0.0842	0.134
4/0	300	302	816	380	0.0525	0.0843
500,000	515	520	1,831	787	0.0222	0.0357
750,000	655	680	2,716	1,129	0.0148	0.0238
1.000,000	780	785	3,546	1,437	0.0111	0.0178
1,250,000	890	895	4,400	1,699	0.0089	0.0145





UNITED STATES RUBBER COMPANY

Electrical Wire and Cable Department

Rockefeller Center

New York 20, New York



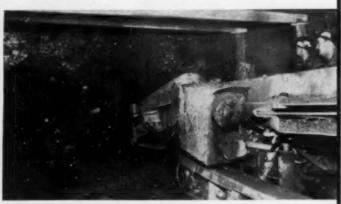
"We get maximum production of coarse coal under all conditions with Du Pont 'Monobel' AA,"

states George Higinbotham, president, Consolidation Coal Company (W. Va.), Fairmont, W. Va.

"We've used 'Monobel' AA ever since it was first introduced into the northern West Virginia district," continued Mr. Higinbotham. "It consistently gives us top-quality coarse coal and, personally, I think it's the most dependable permissible that's come along. Our No. 32 mine at Owings, W. Va., is a typical operation using 'Monobel' AA."



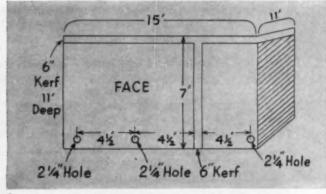
1. Characteristic fall of coal made with Du Pont "Monobel" AA in Consolidation's No. 32 mine. L. H. Kelly, foreman, sounds roof after shot. In his opinion, "Monobel' AA lays the coal down loose, gives good loadability with minimum of fines."



2. Loader moves in quickly after shot, since "Monobel" AA makes a minimum of fumes and smoke. Its water resistance withstands wet bottom hole conditions. Wide spreading action of "Monobel" AA shears back of the cut and ribs cleanly.



3. Loaded buggy shows high percentage of coarse coal consistently produced by "Monobel" AA... representing profitable, high tonnage per man. Small percentage of fines makes cleaning easier and faster.



4. This standard shooting pattern used in No. 32 mine was developed in cooperation with Du Pont technical service men. All rooms are top cut and sheared. Du Pont Iron Wire Electric Blasting Caps are used for maximum economy.

Widely used throughout the coal-mining industry, Du Pont "Monobel" AA has earned the approval of many prominent mine owners and operators. Their experience has proved it to be the most satisfactory permissible they've found. Try it in your own operation. Ask the Du Pont Explosives representative in your district for complete information about "Monobel" AA. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT PERMISSIBLES

Blasting Supplies and Accessories



BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

tin contribution to ROOF BOLTING

A specially designed bolt head now permits the shipment of **PATTIN** Double Expansion Shells assembled on the bolts!

ADVANTAGE OF ENGINEERED HEAD

- 1—Designed to support a place washer he ing a round hole large enough to s over the expansion stell without re moving the shell from the bolt.
- 2-Self-centering design assures centering of plate washer on the head.
- 3—Assures a good thread fit between the bolt and shell.
- 4-No lost parts.
- 5-A definite saving on installation time.

ADVANTAGES OF EXPANSION UNITS

- 1-Double expansion means double holding power.
- 2-A 3-inch parallel contact with the hole.
- 3-No definite drilling depth required.
- 4-Shell can be anchored solidly any place in the hole.
- 5-Will not turn while being tightened.
- 6-No loss of parts as wedge and shell are locked together.
- 7-No special nuts or ears are required on the bolts.
- 8-Anchors equally well in hard or soft roof.
- 9-Wedge supports the entire length of the outer shell.
- 10—Tests indicate that the shell will not fail under a 20-ton pull.

EXTRA

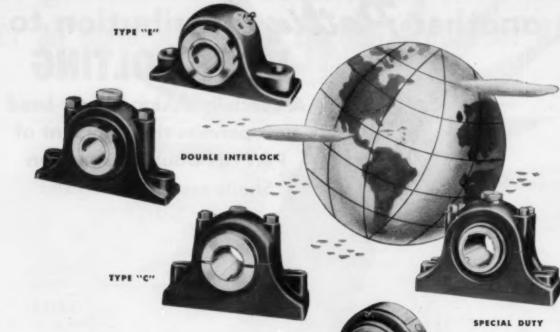
Available in 5/8" and 3/4" sizes. Regular square heads available on bolts if desired.



SHIPPING TUBE

MANUFACTURING CO. The Pioneer in Roof Bolting ESTABLISHED 1888 When Pattin Bolts und Shells are shipped assembled, a protective tube is slipped over the shell to protect the bolt threads and the shell in transit and

MARIETTA, OHIO



Known 'round the World for Dependability —



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DODGE-TIMKEN

In millions of installations Dodge-Timken bearings have proved their ability to cut costs and increase production. Their dependability is unquestioned under every condition of service. Available in five different types, including the new Dodge-Timken All-Steel Pillow Block for grueling, heavy duty jobs. All are sealed both on and off the shaft.

Dodge-Timken bearings are fully assembled

and lubricated — ready to lock on the shaft. They are normally available from distributors' stocks...in a wide range of sizes. Call your distributor or write us for Dodge-Timken bulletins.

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CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory-trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone book.





TORQUE-ARM



ROLLING GRIP AND DIAMOND D CLUTCHES



TAPER-LOCK SHEAVES, SEALED LIFE V-BELTS



Now available! Superior insulation featured in new Cyanamid blasting caps



Cyanamid has for many years been conducting a study of all materials available for blasting cap wire insulation to find one that would offer uniform concentricity—no thin spots. Every type of insulation currently in use has been tested, as have many new materials. Now Cyanamid has an insulation that gives uniform concentricity, assures maximum performance!

This new, organosol plastic insulation is applied to wire by a continuous bath method. The wire is dipped in seven separate baths and is passed through dies to scrape off excess coating between baths.

Each coat is heated to insure perfect set, perfect concentricity. Organosol plastic insulation, because of its uniformity, gives you:

- 1. Greater electrical insulation values
- 3. Greater abrasion resistance
- 4. Non-porosity
- 2. Greater flexibility
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HIGH EXPLOSIVES • PERMISSIBLES • BLASTING POWDER BLASTING ACCESSORIES

Color-Coded for Easy, Sure Identification













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600 TONS PER HOUR...

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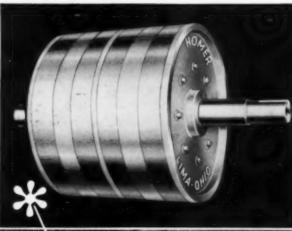
the Best!

Like ALCOA – HOMER is interested in offering industry only the finest. Homer permanent magnetic separators have proved their ability time after time to perform effectively and efficiently, far beyond normal requirements.

If you are planning to use automatic magnetic separation equipment, it will pay to get the facts on Homer Magnetic Separators . . . the separators designed and built to give years of profitable service under unusual and extreme conditions. Let HOMER help solve your tramp iron problems — write us today. The Homer Manufacturing Co., Inc., Dept. 59, Lima, Ohio.

Yes-Homer permanent magnetic pulleys and Homer cross belt magnetic separators are pacing Alcoa's tough conveying and automatic tramp iron removal jobs at their Mobile, Alabama plant.

Lower photo shows Alcoa's 42" x 36" Homer heavy duty permanent magnetic pulley installation, one of the world's largest. This Homer pulley drives the 200' long, 20% troughed slope conveyor, which travels 300 feet per minute, moving bauxite ore at the rate of 600 tons per hour. Slope on the conveyor is 3½' per 12' length. This is one of nine Homer magnetic conveyor units installed in this plant.





Remember... with a HOMER... you are Certain!





Announcing

MONEY-SAVING PLAN ...

RODERICK & BASCOM PEEDI-SERVICE PLAN

right wire rope at the right time! You can increase

Now you can save time and money with the Yellow Strand Speedi-Service Plan!

There's no extra cost, no obligation. All you do is have your nearby Broderick & Bascom dis-

tributor register your equipment. Then, when you need rope, just call, giving machine make and

model and the particular rope needed. The exact size, length and type will be obtained from your record file and the order filled from stocks controlled by these records. Delivery is made ac-

Start saving time and money with the Yellow Strand Speedi-Service Plan. Call your Broderick & Bascom distributor or mail the coupon.

cording to your recorded instructions.

equipment earning time, decrease down time!

HOW THE SPEEDI-SERVICE PLAN SERVES YOU...



File cards, describing each of your machines and its wire rope requirements are filled in by your Broderick & Bascom distributor.



2. The cards are placed in an active file, where your distributor can go to tell in an instant what type and size of rope you will need for any



3. When a line requires replacement, call your Broderick & Bascom distributor. Tell him which machine needs the rope. He will refer to his records

and fill your order immediately from his ample stock of long-lived Yellow Strand.

... a product of Broderick & Bascom Rope Co.
St. Louis, Mo.

FOR SAVINGS ... SAFETY ... SPEEDI-SERVICE

4203 Union Blvd. . St. Louis 15, Mo. Gentlemen: I'm interested in saving time and money with the Speedi-Service Plan. Send me the folder describing the Speedi-Service Plan. Send me the Speedi-Service Plan Equipment Registration Form. Send me the name of my Broderick & Bascom distributor. Signed. Company. Address... State City.

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SELF DUMPING CAGES designed and built by VULCAN of Wilkes-Barre for

SPEED...SAFETY...ECONOMY



The Cage shown in operation above is one of many different types built to withstand rugged, long service with speed, safety and economy.

All mechanical parts are either high grade steel castings, steel forgings or rolled steel plates and sections, riveted and welded together to assure maximum strength per unit of weight.

No matter what your requirements may be in cages, skips or gunboats, the VULCAN IRON WORKS with more than 100 years of service to the Mining Industry is ready and able to serve you. Write for our 20 page Bulletin No. A-457 today. All types of cages, skips and gunboats are illustrated and discussed in detail.



Any information on items listed below will be sent to you immediately.

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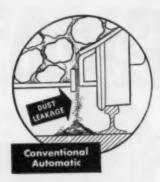
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PRODUCTS: Sodium Cooled, Poppet, and Free Valves^a Tappets^a Hydraulic Valve Lifters^a Valve Seat Inserts^a Jet Engine Parts^a Rotor Pumps^a Motor Truck Axles^a Permanent Mold Gray Iron Castings^a Heater Defroster Units^a Snap Rings Springtites^a Spring Washers^a Cold Drawn Steel Stampings^a Leaf and Coil Springs^a Dynamatic Drives, Brakes, Dynamometers

Only S-D "Automatics" are Safety Sealed Against Dust Leakage







a g

THE DUST STAYS IN THE CAR

The detail drawings above show how you can keep dust off your tracks with the S-D "Sealed Automatic". In the circle at top is shown the conventional drop bottom construction and how dust shakes down and out through the necessary clearance space between the door and the car frame. The lower circle shows how our new Safety Dust Seal carries sifting dust across the open space, providing a 100% offective dust seal.

BEFORE buying mine cars it is important to know that S-D Automatic Drop Bottom Mine Cars offer you an exclusive seal against dust leakage. This means two extra values: (1) Sealed S-D "Automatics" give you a new, safer in-the-mine operation by eliminating leakage of dust. (2) Sealed S-D "Automatics" enable you to make a tremendous reduction in track clean-up costs.

Photograph above of a cross section view of the inside of a Sealed S-D Automatic shows you why dust cannot shake down and out through the necessary clearance space between doors and frame. Note how hood overlaps the drop bottom doors at the ends. Note also the Safety Dust Seal over door clearance space. (This side seal is best illustrated in the detail drawing showing S-D's new Sealed Automatic design.)

Other advantages offered by S-D Automatic Bottom Dumping cars include: (1) from 1/4 to 1/2 ton greater capacity for any overall dimension and (2) the S-D "Twin Safety Latches"... two latches for safe and sure latching that are tripped independently underneath the car for automatic dumping. For complete information write us today.



IRON WORKS

KNOXVILLE

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Keep your haulage

AHEAD of PRODUCTION

with the M·S·A
MinePhone

COMMUNICATION SYSTEM

Reduces frequency of motormen and snappers getting on and off trips—saves time —avoids injury.

Keeps main line haulage-ways free of traffic tie-ups.

> Maintains better control of "empties" for peak loading efficiency.

> > Coordinates trip traffic for safer, more productive haulage control.



Prevents excessive stop-and-start strain on haulage equipment.

> Avoids excessive power loads for more economical operation,

Provides an efficient, time-saving underground "call" system.

Eliminates trip delays necessary when permanent telephone installations are used.

Minimizes chances of error and accidents.

With mechanization increasing production, your haulage system must "keep ahead" to realize maximum tonnage. The M.S.A. MinePhone helps fill this need by providing a modern underground system that maintains smooth, continuous trip movements throughout the mine.

Sending dispatcher's orders instantly and simultaneously to all motormen, who can receive messages and reply while trips are in motion, the M.S.A. MinePhone coordinates haulage movements with production

demands. Messages, transmitted on an "open line" hook-up, keep the track ahead clear for outgoing loaded trips and incoming "empties."

The M.S.A. MinePhone brings greater underground safety, too. Track conditions, derailments, or roof falls can be reported immediately. Time-consuming calls to each individual are eliminated—a big advantage in emergencies. Write today for complete details on this modern, two-way voice communication system.

SAFETY EQUIPMENT HEADQUARTERS

When you have a safety problem, M.S.A. is at your service. Our lob is to help you. MINE SAFETY APPLIANCES COMPANY

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G-E swivel-truck locomotives give high efficiency with high speeds and improved operator protection

Mine operators, constantly alert for new ways to speed up their present haulage to obtain increased output and reduce operating costs, approve the sturdy, powerful G-E swivel-truck locomotive. This high-speed, four-axle locomotive cuts haulage time as much as 50% to 90%, and has safety and operating features that are equally popular with owners and operators.

Hauls bigger loads at higher speeds

Controls on the locomotive are conveniently grouped and co-ordinated for efficient operation. Bigger loads can be started and accelerated rapidly because the smooth application of power permits operation close to the slipping point of the wheels. Equalizing action of spring suspension smooths out the ride over irregular track and lessens track wear. Because it is built to hug the rails, the locomotive can haul trains at higher speeds.

Designed for easy maintenance

There are relatively few parts on the locomotive that require daily or weekly lubrication. All points are readily accessible for quick, easy servicing. The balanced, all-welded frame is a strong, permanently-rigid structure without joints and free from bolts and rivet heads. High, rounded end frames provide maximum protection for the operator.

Built to stay on the job

The G-E swivel-truck locomotive is built for the job and stays on the job because its rugged, carefully engineered construction gives it staying power and requires little maintenance. You, like many other operators, can depend on this locomotive to bring your loads out faster day after day. For more information, ask your G-E Apparatus Sales Office for GEA-4676. Or write General Electric Co., Section 120-66, Schenectady 5, N. Y.

SOME OF THE MINING COMPANIES NOW USING ONE OR MORE G-E SWIVEL-TRUCK LOCOMOTIVES:

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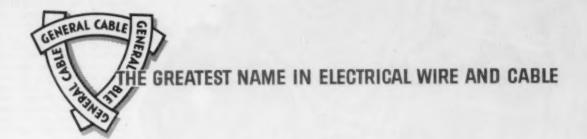
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GENERAL E ELECTRIC





To wire a plant, or wind a coil

IT PAYS TO BUY IN ONE PLACE!

Actually there is only one source for all of the types of wire and cable you may need...that's General Cable. To meet your every requirement, General Cable manufactures bare, weatherproof and insulated conductors of every variety ...maintains vast stocks...the broadest distribution facilities in the industry...ultra-modern plants coast to coast. Specify "General Cable." Don't settle for less.

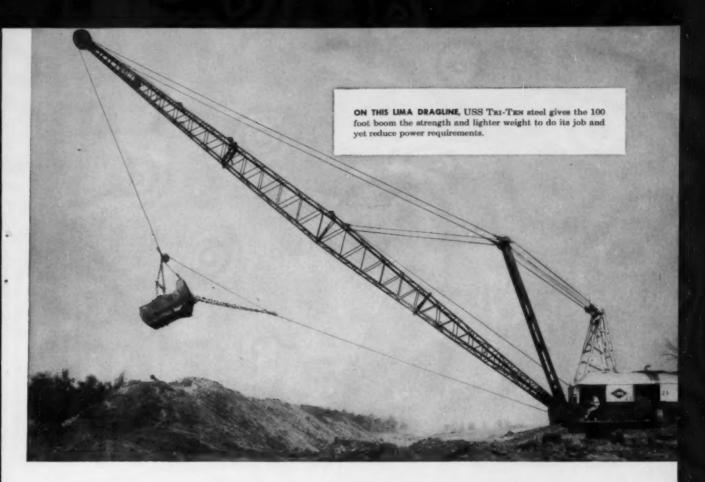


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USS High Strength Steels give your mining equipment the stamina to take the beating of today's high speed operations. Their use insures more productive time for your investment, and you spend less money for replacements and repairs.

USS High Strength Steels—USS COR-TEN, USS MAN-TEN, and USS TRI-TEN—have a 50% higher yield point than structural carbon steel. With these famous "steels that do more" you can build maximum

strength and toughness in vital parts ordinarily prone to failure. With them, high resistance to wear, fatigue, abrasion and impact can be incorporated. And, if your equipment must operate in sub-zero temperatures or under unusually corrosive conditions, high resistance to these destructive forces can readily be secured.

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strength and life of parts without increasing their weight. Or, you can use these steels in lighter sections to reduce equipment weight without reducing present strength. A reduction in steel weight often means that you can build your equipment bigger to move more payload without using more power to move it.

For more information or application data about USS High Strength Steels phone or write our nearest office.

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NATIONAL TUNE DIVISION, PITTSBURGH - TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. - UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS

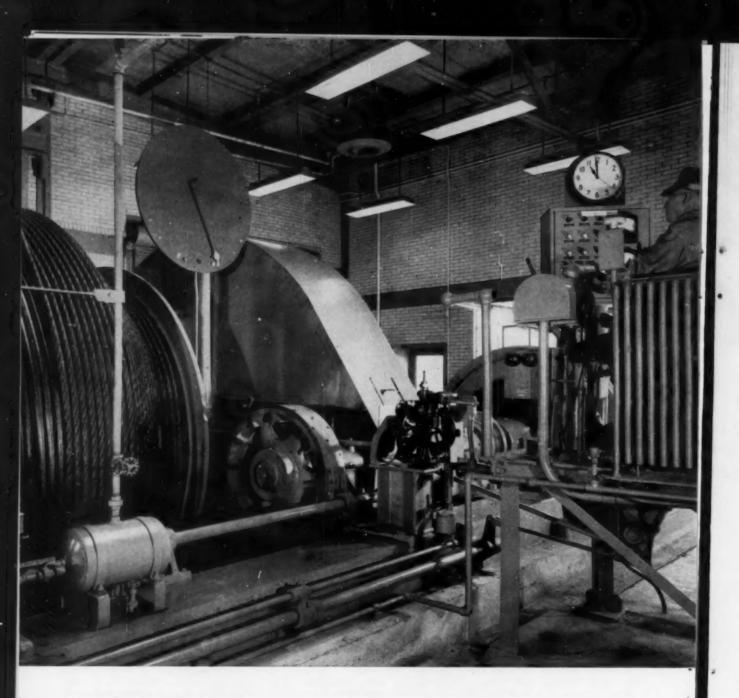
USS HIGH STRENGTH STEELS

USS COR-TEN . USS TRI-TEN



USS MAN-TEN . USS A-R STEEL

4-20



Wire Rope at Work—In a coal mine one of the most challenging jobs assigned to wire rope is lifting heavy loads up a vertical shaft. Because of the tonnages moved, the hoisting speeds involved, and the rapid acceleration, the rope is constantly subjected to stresses and strains. And there are always the pressures on sheaves and drums to contend with—a factor that tests the rope to the utmost.

A case in point is the installation shown above. It's a modern hoist at a West Virginia mine, and the top rope speed is approximately 950 ft per min. Skips loaded with ten tons of coal are lifted a vertical distance of 600 ft. Here Bethlehem rope is the choice—Type H flattened strand, 1½-in. diameter, Purple Strand grade, lang lay, fiber core. Day in, day out, it is doing a first-class job in meeting the heavy requirements of this exacting service.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel

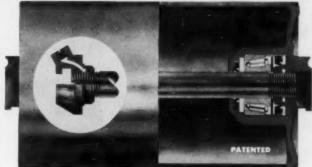
Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

MINING • CONSTRUCTION • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

You Need ... Idlers

GO UNIT-SEALED PRE-LUBRICATED TIMKEN BEARINGS



Saves Grease!

Saves Labor!

Saves Belts!

Saves Saves

Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klozures, are the answer to the operator's prayer.

The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellant grease of a stable consistency with a wide temperature range for long life.

Most important—this construction permits operating the Continental "UST" Idler for extended periods of time without relubrication for 1-2-3 years or longer depending upon the severity or character of conditions.

For detailed information on these idlers write for Bulletin CA-116

Long Life - THE ULTIMATE IN MINIMUM MAINTENANCE



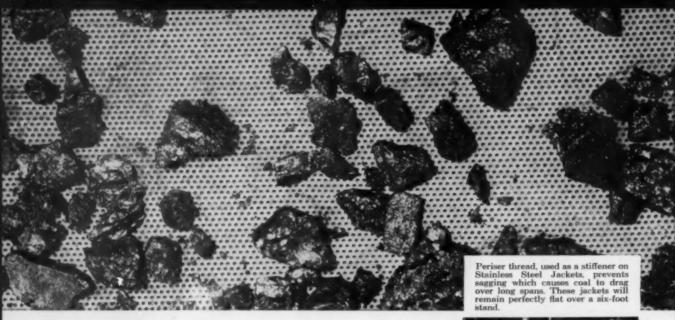
INDUSTRIAL DIVISION CONTINENTAL GIN COMPANY

ENGINEERS



CGC ATLANTA . DALLAS . MEMPHIS . NEW YORK CGGC MANUFACTURERS





25 years of "more coal and better coal with less manpower"

that's how Stainless Steel pays off for The Hudson Coal Company

▼ Back in 1929, The Hudson Coal Company, Scranton, Pa.—producers of Pennsylvania Anthracite since 1823—conducted side by side tests of every type of metal screens on the same shaker. The results of that test caused Hudson to shift to the use of Stainless Steel in every possible application in its five big anthracite breakers.

Hudson's preparation department sums it up this way: "We have been using Stainless Steel continually since that time with the result that we are producing more Anthracite, better Anthracite, and we are doing it with less manpower!"

Under actual operating conditions in Hudson's breakers, Stainless Steel has outlasted carbon steel 9-1 and bronze by more than 5-1. In addition, it holds a "stand" of six feet without sagging and causing the coal to drag. Stainless Steel also has superior resistance to erosion by the 17,000 gallons of water that pass over it every day.

The 154 Stainless Steel screens operated by Hudson have another advantage. No rust accumulates on them during shutdowns, requiring maintenance and causing metal loss when the rust is removed.

"In the case of chutes," Superintendent J. F. McLaughlin says, "there is no comparison between Stainless and ordinary steel. In two months of service using ordinary



This chute lined with Stainless Steel, carries wet coal from the shaker discharge into the cone cleaner. The liners are replaced only every four or five years.

steel, the entire body of the chute would have to be replaced. But with Stainless Steel we never have to replace the body and the liners give us up to five years of efficient service."

Stainless Steel can do the same for you in your breaker or preparation plant. Especially if it is perfected, service-tested U·S·S Stainless Steel.

UNITED STATES STEEL CORPORATION, PITTSBURGH . AMERICAN STEEL & WIRE DIVISION, CLEVELAND . COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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WHITED STATES STEEL FRONT COMPANY NEW YORK

U·S·S STAINLESS STEEL

SHEETS . STRIP . PLATES . BARS . BILLETS



PIPE - TUBES - WIRE - SPECIAL SECTIONS

BALANCED EXPLOSIVE
IN EVERY GRAIN IN
EVERY STICK OF
KING RED CROWN

PATENTED GRANULAR STRUCTURE MEANS MORE COAL PER SHOT

More coal at less cost per shot . . . that's what KING RED CROWN Gives you. RED CROWN's granular structure is patented: every grain contains a balanced explosive composition. This is the secret behind RED CROWN's slow, heaving, spreading action, similar to that of black powder. As a result, you get more, better, cleaner lump coal with a minimum of slack . . . at less cost per shot. Smoke, fumes and downtime are greatly reduced.

Write or phone today for a demonstration right in your mine. You'll agree that KING RED CROWN is the most effective, most efficient form of controlled-power ever provided in Class A permissibles.

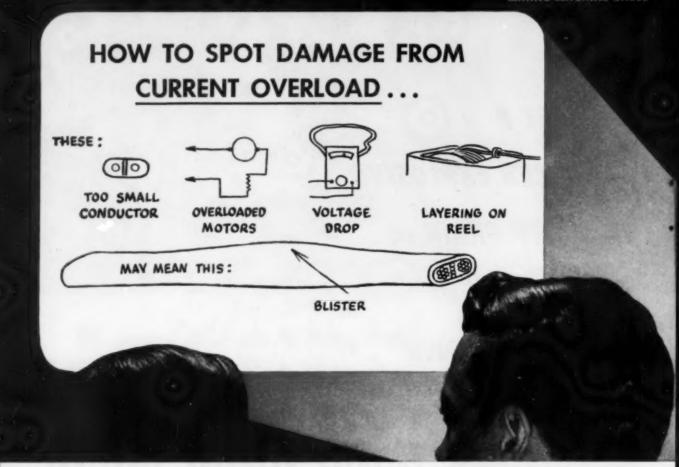


THE ONLY SURFACE SENSITIZED PERMISSIBLE



THE KING POWDER CO., INC.

MAKER OF QUALITY EXPLOSIVES SINCE 1878



...AND WHY THERE'S GREATER HEAT STAMINA IN ANACONDA'S NEW MINING MACHINE CABLE

Blisters, formed by gases from overheated insulation, are a sure sign of cable overloading. A torn cable may result. Since you can't always control overloads, it's important to choose *quality* cable.

Today, due to better design, jackets and insulation, good cables shouldn't cook on the reel the way they used to. But this only makes overloads harder to detect. They still may be present . . . caused by too small a conductor, overloaded machines, voltage drop or even layering of the cable. With 4 layers on the reel, according to I.P.C.E.A., unventilated bottom layers lose 65% of capacity.

WHY THE NEW ANACONDA CABLES ARE SAFER

First, they are more flame-resistant. Jacket is made from a new neoprene formula. Improved cold-rubber insulation gives greater heat stamina. Patented breaker strip* insures a safer ground. No ANACONDA Cable has ever failed a U. S. Bureau of Mines flame-test!

CABLE LIFE NOW MUCH LONGER

In 15 mines recently surveyed, Anaconda Cables on shuttle cars are lasting up to 300% longer than cables made only a few years ago. Together, jacket and insulation protect these cables better—especially in wet mines where sliver-cuts can cause shocks. The cables are tougher. New-type stranding flexes better under tension.

All this means economy because one break in cheap cable costs more than you can save by buying on price. For a sample of this new cable, call your Anaconda Sales Office or Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

ANACONDA

TODAY'S HEADQUARTERS FOR MINE CABLE

aU. S. Patent No. 2,455,773













the machine is started cold and during long periods of continuous operation.

Transmissions and hydraulic systems have been kept clean and protected against wear. There have been no delays for warming up the machine. There has been no time wasted in applying the Superla Mine Lubricants. The grease grade has poured readily from bung-type barrels and has been dispensed easily

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assure protective lubrication both when

from hand-operated grease guns.

The Standard Oil lubrication specialist serving your section of the midwest can help you simplify lubrication and get better results through the use of SUPERLA Mine Lubricants. You can contact this man by phoning your local Standard Oil Company office. Or, write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

What's YOUR problem?



H. Dillinghom, of Standard Oil's Evansville, Indiana, office, has helped this midwest mine gain an important versatility in their lubrication. Practically all of this mine's underground lubrication is handled by two grades of SUPERIA Mine Lubricants.

H. Dillingham is one of a corps of Standard Oil lubrication specialists located throughout the Midwest. These men are specially trained and have a wealth of practical experience to help you with your industrial or mining lubrication problems. One of these men is near your mine. You can reach him easily and quickly by phoning your local Standard Oil Company office. At no obligation to you, the Standard specialist will be glad to discuss savings that you can make with SUPERLA Mine Lubricants and such outstanding products as:

one line of oils that provides cleaner operation of loader and crane hydraulic units; supplies effective lubrication in compressors, gear cases, and circulating systems. One or two grades can replace a wide variety of special oils and lubricants.

On open gears and wire ropes, these greases strongly resist washing and throw-off. Their superior wetting ability affords better coating of gears and better internal lubrication of wire rope.

STANDAR

(Indiana)

STANDARD OIL COMPANY



"This Boy Scout stuff pays off!"

"I use the square knot to tie two pieces of Plain Primacord together when I want to lengthen the trunk line aboveground. It can be drawn up tight and won't slip back. But I never use any knot in a hole. It might hang-up the explosives when loading, and you don't want that to happen.

"A 500-ft. reel of *Plain* Primacord weighs only 9 pounds — it's easy to lay it out fast. You can use it in small or shallow holes, too.

"But when we go down deeper I want Reinforced Primacord. It has a tough cover, and greater tensile strength.

"When I'm handling those heavily reinforced explosives containers, or when I'm working in deep, ragged holes, I go for Wire Countered Primacord.

"And for river crossings—or where a field shot must stand a long time before blasting — I use *Plastic Reinforced* Primacord.

"If you want good results every time, use the right Primacord — and use it right!"

P-12

See your explosives supplier or write for information to

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut

Also Safety Fuse since 1836

PRIMAGORD detonating fuse
PROVED and PPROVED

FEBRUARY, 1954

IVAN A. GIVEN, EDITOR

Foundation for Progress

NOT AS ROUGH as the pessimists foresaw it and not as good as the optimists felt it might be is perhaps a fairly accurate summary of developments in the bituminous industry in 1953. On the basis of preliminary figures, production was off less than 2%, and the deficit may be even smaller when the final figures appear. Anthracite, in contrast, fared nowhere near as well, preliminary figures indicating a drop of over 25% in production in 1953, with warm weather again playing a major role in the decline in demand in anthracite territory.

Upturn in a Year?

What of 1954? Again it seems quite likely that the final result will fall between the marks set by the pessimists and the optimists. Assuming that business will continue to flourish, even though off from recent boom peaks, bituminous coal could equal its 1953 output and, at the worst, should not be too far below it. All of which leads to the conclusion that coal—bituminous particularly, and perhaps anthracite as well—is not over a year away from starting to move up again, even if only slowly, particularly as new generating equipment begins feeding the utility lines, and as the two coal industries make further progress with cost-cutting, research and marketing programs designed to improve their competitive power.

The Difference in '53

Until the upturn comes, as it will, the industry is again faced with all the added problems involved in adjusting to a rate of demand well under its ability to produce, with consequent increase in the severity of competition. The year 1953 was no exception to this rule, and the pressure continues into 1954—with at least one major difference, however, compared to previous periods of low production. Prices have suffered and income has

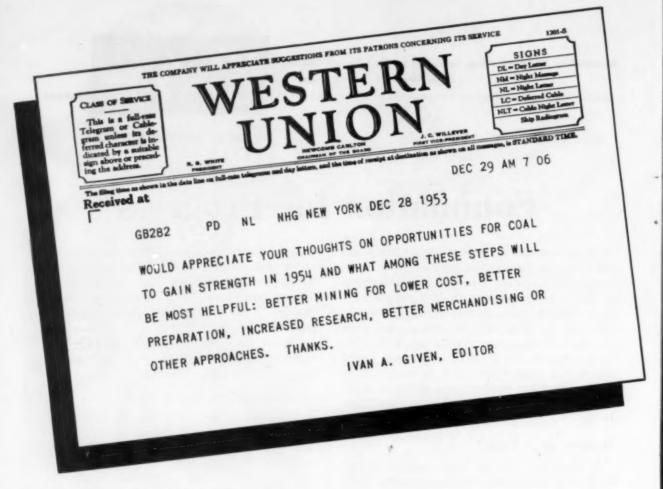
dropped, but runaway price cutting has yet to put in its appearance, in sharp contrast to other eras in the past. In part, this is a reflection of the fact that the future outlook is good. More significantly, perhaps, it reflects a better understanding of the industry's problems and, more particularly, a sharp conviction that sticking to the fundamental principles of sound management is the best practice in both the short and long runs.

Benefits From Adversity

If benefits can flow from adversity—and history proves they can—it may well turn out that 1953 and 1954 will prove to be years of significant achievement. It is clear beyond question, as the review material elsewhere in this issue shows, that the industry is approaching its problems realistically and with the conviction that it can solve them through intensified application of proven principles. Definite progress was made in cutting cost, enhancing quality and promoting safety—and in laying the groundwork for additional advances in the future. Even more outstanding, there was a sharp increase in emphasis on research to develop new markets and on modern merchandising to capitalize on coal's undeniable advantages.

Biggest Gains

A down-to-earth approach to its problems and a quiet confidence in its ability to solve them thus stand out as the coal industry's greatest gains in 1953. In combination with intensified research and merchandising, and with demonstrated ability to apply cost-cutting, quality-enhancing and safety-promoting developments, they stand as coal's best assurance that it will be called upon to supply the new demands for fuel and raw materials coming in the future, and thus will continue to grow and prosper accordingly through better service to the Nation.



The Executives' Forum

How Coal's Leaders See 1954

Hard work on all fronts is the key to better times in 1954 and the years ahead.

That's the gist of replies from top coal executives to a telegram sent them at the turn of the year. Their views, published below, tell how they see 1954 and what they think coal needs to move ahead.

"... looking forward to a more profitable year."

What about the year 1954?

The whole world is faced with a golden opportunity, unparalleled in modern times, if warring nations would only return to peacetime pursuits. It is not to be presumed that the change to peacetime will not be without its hardships on some, but the alert will have already anticipated this change and will be prepared to meet the inevitable softening of markets.

By this, I do not mean that business as a whole will necessarily be reduced to such a point where the people will become panicky, as that is a thing of the past. But business men must face keen competition.

In our small company during the year 1953, we expended well over \$1,000,000 for machinery and equipment and improved preparation facilities. I predict that within the next year or so, more improved continuous mining machines will be an accomplished fact.

The sales department will have a hard and difficult job before them. But that, too, can be surmounted by diligent and aggressive efforts backed up by good merchantable coal.

I do not think it will be necessary to reduce wages. In fact, as I see it, wages must stay up. But more economical ways to produce coal must likewise be found.

We are looking forward to 1954 being a more profitable year than 1953. The field is ripe unto the harvest. So why hesitate? Reach out and get your share.

H. B. Salkeld, President Tasa Coal Co., Zelienople, Pa.

"... lower delivered costs."

In my opinion, the best opportunity for coal to gain strength in 1954 is through lower delivered costs.

Richard Downing, President Freeport Gas Coal Co., Cleveland

"Improved sales effort and services . . ."

Improvement in any items you mentioned would strengthen the coal business in 1954.

It seems, however, that improved sales effort and services to customers, together with an intelligent price policy, would offer more immediate relief to the industry's depressed condition than would any other improvement in any phase of the business that seems to be in the offing for the immediate future.

O. Gressens, Executive Vice President Peabody Coal Co., Chicago, III.

". . . control importation of oil."

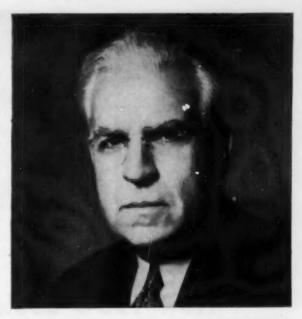
The quickest and most effective way coal can gain strength in 1954 would be through immediate action to control the importation and distribution of residual oil. Helpful effects would be almost immediate.

In my opinion, the next most effective contribution to strengthen the coal industry would be the control of production and distribution of non-union produced coal. The Big Sandy field has strong competition on the east by non-union coal produced in Virginia and on the west by non-union production from Clay and Leslie Counties and Western Kentucky. In other words, there is gross discrimination.

All production should be measured by the same yardstick, whether it is union or non-union. Perhaps this could best be handled by tying prices to production through federal legislation, thereby putting all producers on the same basis. Prices of electric power, oil and gas are at present regulated substantially in this manner.

Few people realize that the public-service commissions are becoming "union-busters" by forcing the public-utility plants to purchase their coal at prices below cost where the coal is produced by union labor. They have made such a persistent effort to beat the prices down that the coal producers either have to go non-union or cheat on the contract. Furthermore, they are being driven to the lowest transportation cost, which is either by river or truck. We, as producers, are being forced by the government and states on one hand to recognize labor unions while on the other hand they are forcing the public-utility plants to beat prices down to where we cannot possibly pay the union scale and comply with the contract and break even. A very large number of people have the erroneous idea that the salvation of the coal industry lies in the increased consumption of coal by steam publicutility plants. We know this is not true.

I see very little effect in the future from lower cost,



"Must ask and receive a fair price."

An assured coal supply for the United States in 1954 means adequate power and abundant heat for the many-sided domestic and industrial phases of the economy of the Nation in peace, defense or war.

Long strides have been made in preparation and in mechanization, with resulting increased productivity and overall cost reductions. The coal industry will strive in 1954 to further improve all of these, together with the ever-present need for bettering the industry's safety.

The greatest need in 1954 is an improved realization of federal and state authorities, producers and customers, that in spite of the unrealistic competition of some competitive fuels, the coal industry must ask and receive a fair price for its product if it is to remain healthy.

L. C. Campbell, President, National Coal Association, and Vice President, Eastern Gas & Fuel Associates, Pittsburgh, Pa.

better preparation and better merchandising. We all know, of course, that there is a vast field for further research and we will eventually recapture some of our lost markets through the developments resulting from this further research. However, this is long-range.

J. E. Bowman, President Utilities Elkhorn Coal Co., Pikeville, Ky.

"Quit price cutting . . ."

The most important thing for 1954 you have failed to mention.

That is: Quit price cutting and get more money for your coal. Coal in the ground is one of our Nation's greatest assets. Keep it there unless it can be sold for a profit.

The industry has made great strides in 1953 in mechanization and preparation. Those that are not up to date now will fall by the wayside. Those that are up to date should watch future technological developments.

The next most important thing is research. Our industry is very negligent along these lines. They now take the



MR. KIDD-"Cooperation the formula for results."



MR. CASE_"Will begin strength building in '54."



MR. FOX—"Brightest spot lies in research field."

How 1954 Looks in Anthracite

industry.

"Eliminate high-cost mines . . ."

The coal industry has just come through a year in which the truth of the familiar appeal, "O Lord, deliver me some evil out of which good may come," was convincingly demonstrated.

For in searching for remedies to cure its ills, the industry showed a willingness to grapple with its to mest problems. I regard this as an encouraging omen for the future. The unprecedented spirit of cooperation forged

among various elements of the industry should show the way for coal to come back.

As examples of this realistic approach to the challenge of difficult times, caused principally by an unbroken stretch of abnormally warm winters and the sharp inroads of rival fuels, we can point to such facts as:

 Practically all major companies have closed unprofitable mines and have firmly stated they'll close others if needed.

attitude, "Let the other fellow do it and pay for it." But everybody, large and small, in the industry must give some money for research.

Better merchandising need not be mentioned because every sales manager should have done this before.

Last but not least, present a solid front of the entire coal industry in labor matters and negotiations.

Henry C. Woods, Chet nan Sahara Coal Co., Chic o, Ill.

". . . hard work and farsightedness."

We feel that coal can gain strength in 1954 by hard work and farsightedness.

We must be farsighted not only in developing our mines, but in developing our markets and developing new and more efficient users.

The expanding utilities represent coal's greatest expanding outlet. The coal industry should see that their demands quality-wise and cost-wise are assiduously met so that every possible coal user becomes a coal user.

Better mining for lower cost, better preparation, increased research and better merchandising are separately so important that none of them can be singled out as being the most helpful.

More efficient mining resulting in lower costs will probably provide the most immediate help for individual operators.

But increased research and better merchandising will

provide the long-range assistance that is needed for our

H. G. Schmidt, President
The North American Coal Corp.
Cleveland, Ohio

"Continuous mining will be most helpful."

We of Consol (Ky.) expect to make further gains by effecting further economy at present mines, by expanding our mechanical program into more continuous mining and by producing the best possible product through our cleaning plants in the year 1954.

Continuous mining will be most helpful in securing better costs.

G. O. Tarleton, President Consolidation Coal Co. (Ky.), Jenkins, Ky.

"Industry needs a complete overhauling . . ."

Generally speaking, our bituminous coal industry needs a complete overhauling and modernization, with stress on economic readjustments and sound merchandising.

Growing demand will fall to the low-priced, low-cost fuels for large power-plant consumption. High-grade specification metallurgical coals will continue in demand.

Only a relatively small percentage of our industry is

- 2. The leadership of the United Mine Workers of America is leading a drive to increase man-day productivity.
- Retail dealers have joined hands with the anthracite producers to back a new public-relations campaign to "re-sell anthracite."
- The UMWA has taken formal note of the increasing gravity of competition from non-union mines under-pricing brand-name coal.

Our energies must be concentrated on eliminating highcost mines and attaining greater individual productivity. If we can thereby reduce the cost of a ton of coal, the industry should have improved results in 1954. I am confident the present harmonious relationship between management and labor will provide the formula to bring this about.

> Glenn O. Kidd, President Lehigh Navigation Coal Co., Lansford, Pa.

"... cautious optimism for 1954."

Believe coal industry will begin strength building in 1954 for many reasons. In order of importance, I feel that these are:

- Better mining for lower costs through increased mechanization, resulting in more tons per man-day.
- Increased research in fields of metallurgy, chemistry, gasification.
- 3. Knowledge gained during past 2 yr of size and character of domestic market will enable producers to avoid losses as in last 2 yr.

My general attitude is one of cautious optimism for 1954.

F. O. Case, President Glen Alden Coal Co., Wilkes-Barre, Pa.

"Allocation plan . . . brought up to date."

Anthracite producers, according to published reports, suffered substantial losses in 1953. Contributing to this situation were tonnage losses attributed to mild weather and the inroads of competitive fuels, resulting in a highly competitive market and unstable prices.

The likelihood of anthracite's gaining strength in 1954 will depend on three important developments:

- 1. The allocation plan under the Pennsylvania State Department of Commerce, now outmoded by changes of productive capacity within the industry, must be brought up to date if it is to effectively balance production with demand, provide a better equalization of working time and stability in the anthracite market.
- 2. The restriction of importation of foreign oil, particularly residual oil, by the federal government must be had for the protecton of both bituminous and anthracite, the railroads and allied industries.
- 3. Opportunity to increase sales will be brought about through research activity. New uses have been developed for the smaller sizes, such as an admixture in coke production, zinc ore reduction, the treatment of phosphate rock, pot lining in which aluminum oxide is reduced to metallic aluminum, and in agglomerating and pelletizing low-grade iron ore. Improved equipment for combustion and ash removal, together with better merchandising practices in the home-heating field, are of paramount importance to successfully cope with the competition of other fuels in this field.

The brightest spot in the future of anthracite undoubtedly lies in the field of research covering both fuel and non-fuel uses of this great natural resource.

Edward G. Fox, President
The Philadelphia & Reading Coal &
Iron Co., Pottsville, Pa.

capable of low enough production costs and is suitably located from a transportation angle to compete profitably in today's markets. The large percentage of higher-cost coals on which industry will eventually have to draw to satisfy its projected consumption are being priced out of the present-day market and many substantial producers are currently operating at a loss.

Economic readjustment, reduction of over-production, better mining methods and a much more cooperative, realistic and sound merchandising program aimed at higher realization—all will have to be worked overtime for the industry to gain strength and stature in the coming years.

T. G. Gerow, President
West Virginia Coal & Coke Co., Cincinnati

"Fortitude and intelligence in sales."

As the present competitive situation will automatically provide sufficient incentive for continued control of both production costs and preparation, it is my considered opinion that the major efforts of the coal industry during 1954 should be devoted to public relations and intelligent merchandising with particular emphasis on the latter.

During the past year, our industry made some progress in its efforts to command national recognition. During the coming year, we should be more vocal on this point, with particular respect to legislation constructive to the industry. As in the 30's, however, over-production is again the main problem. This now necessitates fortitude and intelligence in sales in lieu of destructive price cutting, which inevitably not only dissipates the assets of the industry but also destroys the respect of its patrons.

Historically, it has been seldom that intra-industry cooperation has been more needed than now to avoid a repetition of the deplorable debacle that occurred in the 30's

> P. L. Shields, President Spring Canyon Coal Co., Salt Lake City

"Stabilization, . . . elimination of price cutting."

Our thinking:

Greatest need of industry is stabilization of markets and elimination of price-cutting hysteria.

H. C. Livingston, Vice President Truax-Traer Coal Co., Chicago, III.

"We will continue to be optimistic."

My thoughts as a coal operator in Central Pennsylvania as we approach 1954:

We will continue to be optimistic, as we have always been, that each day, each week, each month and every year will be better than the previous one just experienced. It is this optimism that keeps us in the producing end.

For the continued prosperity of the industry, it is my feeling that better mining for lower cost, better preparation, increased research and better merchandising are all very essential.

> R. S. Walker, President Bradford Coal Co., Bigler, Pa.

"United front in industry . . ."

My thoughts for strengthening of coal industry in 1954 are in following order of importance:

- 1. United front in industry itself and allied industries.
- Labor and management combined to effect reduced freight rate.
 - 3. Restriction of foreign residual fuel.
 - 4. Defeat of program to import foreign gas.
 - 5. Reduced mining cost.
 - 6. Better merchandising.
 - 7. Recovery of old markets and pursuit of markets.

Walter J. Johnson, President Sheridan-Wyoming Coal Co., Monarch, Wyo.

"Production is ahead of consumption."

In my opinion, the greatest opportunity for the coal industry to gain strength in 1954 would be an attempt on the part of coal operators to reduce production to approximate consumption.

Better mining for lower cost is paramount, better preparation necessary, and research very important. But our industry cannot be stabilized as long as production is ahead of consumption.

S. B. Johnson, President The Lorain Coal & Dock Co., Columbus, Ohio

". . . broadening of markets through research."

If coal is to regain a part of its lost market in 1954, it must be produced at a lower cost. This can be done if there is no change in the present contract.

The future of the industry depends substantially on broadening of markets through research.

F. L. DuPree, President Clover Darby Coal Co., Harlan, Ky.

". . . recommend increased research."

We do not see any possibility of any marked change in coal production during 1954 over 1953, although restrictions on the importation of residual oil would aid the industry now and keep its productive capacity available for the fuel that will be required in the near future.

For 1954 we recommend increased research to take care of wider future markets and installation of improved mining methods for lower costs.

> J. G. Kidwell, President Haywood Coal Co., Fairmont, W. Va.

". . . plus the old determination."

Just more of each plus the old determination. Happy New Year!

Hugh B. Lee, President
Maumee Collieries Co., Terre Haute, Ind.

". . . cheerfully approach our job for 1954."

The prospect of a further decrease in coal consumption in 1954 presents a real challenge to the industry. This challenge, if courageously met, will result eventually in a healthier and more prosperous industry. Human nature is so constituted that its finest accomplishments are made under the pressure of adverse circumstances. I am sure that the effect of this fact will manifest itself in the progress that will be realized in the art of mining coal in 1954.

Obviously, the most immediate necessity in our business is a reduction in the producing cost. This calls for improvement in methods and machinery. I am certain that we will experience notable progress along these lines in 1954

However, it seems to me that a more fruitful field of endeavor is in the realm of improved production psychology. If every member of management and every worker were determined to produce as efficiently as possible, the results would be startling. I am certain that there will be a noteworthy increase in productivity in the coming year.

It is to be hoped that saner and more realistic merchandising policies will also be experienced. Economic conditions make it certain that those who attempt to stay in business by selling their product at a price below their cost of production will quickly experience disaster. Our interests in the long rum will best be served by giving the customer a consistent high-quality fuel in dependable supply, produced by the best preparation equipment available and sold at a price which will provide a reasonable return to the investments of the stockholders.

I submit therefore that we may cheerfully approach our job for 1954 with the realization that painful as some of its problems may seem, they are characterized by a very considerable measure of disguised blessing.

James Hyslop, President Hanna Coal Co. Div. Pittsburgh Consolidation Coal Co. St. Clairsville, Ohio

". . . research offers best possibilities."

For increased coal production in 1954 and future years we consider increased research offers best possibilities.

We have in mind the ultimate goal of a wider use of a refined or remade coal product in industry, possibly in competition with oil and gas for diesel or motor transportation, and new coal distillation and hydrogenation plants with an output of new drugs and chemicals and gas to compete, at least in certain areas, with natural gas.

Lower labor costs, if obtainable through union bargaining without chaotic conditions, would be highly desirable and worth striving for.

> C. S. Blair, President Black Diamond Coal Mining Co. Birmingham, Ala.

"Need increased research to reduce costs."

Our conditions have been such that our domestic business, such as graded coal, has been slipping these past 10 yr and now is at a very low ebb. We receive our best prices for this coal.

My idea in better mining for lower cost is that we should have better mechanical equipment. We now have some of the latest continuous miners in our mines but the upkeep on these machines is very heavy and the time lost at the face, I would say, amounts to better than onethird of the time they should be working. Of course, these are new machines and it will take time to work the "bugs" out of them. They are hydraulically driven, with hoses, cables and fittings that are placed in small places. There should be a different arrangement made so that we would have better use of power with less breakdowns.

Of course, these machines produce a rather large tonnage per man. For this kind of mining you must have projections that are favorable and where you get a better and longer face. You are restricted for clearance on account of protection for men and the face. Improvement of this equipment could be made in respect to governing the quality of coal mined as to moisture, size and im-

purities from the top and bottom.

In my opinion, the better system of mining will be longwall and, where possible, longwall retreating. You would have to project your mine for such mining because the lessors demand a big percentage of extraction of tonnage per acre.

Better preparation is one of the necessary things because you now have to put the best prepared coal you can on the market. I think we have the tops in precision cleaning.

It is necessary that we have increased research in every way possible to reduce costs. I have had wonderful results in many ways in this project. I have been in mechanical mining for 40 yr and have always been one of the first to try improved machines.

As for better merchandising, I feel we should have closer contact with the business so that we can have the best coal to suit the necessary supply. The people are now buying the best quality coal, especially for generation of steam, which demands the better coals. We have spent considerable money in this manner.

In respect to markets, it is necessary that we persuade the greater use of coal by research in the development of new products and usages.

As for other approaches, it is time the government realizes that we must have some protection. They should protect us by limiting the importation of fuel oils. This is hurting us considerably and stops the companies that would like to produce. At the present time, coal cannot meet the price of oil. Our labor rates are the highest paid in the country. We have the very best men and it is pleasing to know they want to produce.

Also, I feel that the railroads should work with us by giving us the advantage of freight rates that would be favorable. They get a lot of business through hauling coal.

Richard T. Todhunter, Sr., President Barnes & Tucker Co., Barnesboro, Pa.

"Work harder to make 1954 a better year."

For coal to gain strength in 1954, producers must improve mining methods to increase per-man-day production, resulting in lower cost, and must improve the quality and preparation of their product to the fullest extent possible.

Our sales representatives must improve their service to the consumers, providing combustion service where necessary, and more actively and intelligently compete with other fuels. All of us must actively merchandise our product rather than peddle it on a price basis.

The year 1953 has been a satisfactory year for our companies and we are preparing to work harder to make 1954 a better year in spite of continuing discouraging loss of business to other fuels.

J. H. Schneider, Chairman Dawson Daylight Coal Co. Dawson Springs, Ky.

"Aggressive and sensible sales policy . . ."

The coal industry can only gain strength in 1954 and future years by pursuing an aggressive policy.

Productivity must be constantly increased and costs lowered. To achieve this goal, labor relations must be improved and continuing heavy investments must be made in better types of equipment as they become available.

An aggressive and sensible sales policy is another requisite if the industry is to remain solvent. It is foolish to attempt to force coal on the market through constant price reductions. Such a policy can ultimately lead only to bankruptcy. The industry is entitled to and should demand a fair price for its product.

Hooper Love, President
West Kentucky Coal Co., Madisonville, Ky.

"Gas and oil in abundant supply."

Natural gas, diesel and fuel oil are in such abundant supply at such reasonable prices throughout the Middle and Southwest as to preclude promise of any improvement in the market demand for coal in these sections during 1954.

J. G. Puterbaugh, President
The McAlester Fuel Co., McAlester, Okla.

"Better merchandising and marketing . . ."

In the year 1953, the competition has been as keen as I have ever seen it and the price structure has demoralized substantially due to over-production, less coal consumed and oil and gas competition.

As we look into the year 1954, naturally we should strive for lower cost and more uniform preparation but we should look forward to better merchandising and marketing of our product. Better merchandising can be accomplished through selling agencies such as Appalachian Coals, Inc.

R. E. Salvati, President Island Creek Coal Co. Huntington, W. Va.

". . . careful planning and much hard work."

Coal will gain strength in 1954 because the industry will be one more year closer to that date at which production will equal consumption through the elimination of high-cost producing units and a more realistic relation between the cost of labor per ton and the ultimate cost per ton of coal in the consumer's facilities.

Before that date is reached, it will be necessary to lower cost of production, engage in increased research both in mining methods and utilization, and drastically rejuvenate our merchandising.

All of these can be accomplished only by careful planning and much hard work.

Harry LaViers, President
South-East Coal Co., Paintsville, Ky.

What Happened to Coal and Its Competitors in 1953

How Coal Did

	195	2*	1953†
BITUMINOUS			
Production, tons	466,840,782	450,00	0,000
Per cent stripped	23.3		25
Value at mine, per ton	\$4.90		\$4.98
Mechanically loaded under-			
ground, per cent	57.9		60
Mechanically cleaned, per			
cent	48.7		52.7
Stocks, tons	76,745,0001	82,381	,000 §
ANTHRACITE			
Production, tons	40,582,558	30,02	3,000
Per cent stripped	26.6		27
Value at mine, per ton	\$9.81		\$9.27
*USBM. †Estimated.	1Dec. 31.	Nov.	30.

Coal and the Electric Utilities

	1952	1953°
FUEL USE		
Coal, tons. Oil, barrels. Natural gas, Mcf	67,119,517	118,000,000 93,700,000 1,023,000,000
CAPACITY AND GENERATION		
Installed capacity, kw Generation, 1,000 kw-hr	78,588,941 399,223,620	89,728,022 447,000,000

Source: Federal Power Commission. *Projected from Sept. 30.

Coal and Steel

(Million T			
	1952	1953°	1954†
Steel capacity, Dec. 31	117.5	124.3	126.0
Production	93.2	111.6	100.0
Coal use, coke ovens and steel and			
rolling mills	103.9	120.0	110.0
*Estimated. †Predicted.			

What Happened in Oil

(1,000 bbl)		
	1952	1953*
PRODUCTION		74
Domestic crude	2,289,836	2,359,000
Domestic residual	453,897	455,000
IMPORTS		
Crude	209,591	242,000
Refined products	138,916	145,000
Residual	128,479	137,000
EXPORTS		
Crude	26,727	21,000
Refined products	132,992	128,000
Residual	27,921	25,000

Source: USBM. *Projected from Oct. 31.

How Coal's Workers Did

	1952	1953*
BITUMINOUS		
Men working, average	335,217	302,400
Avg. weekly earnings	\$78.32	\$85.74
Peak weekly earnings	\$91.36	\$94.371
Avg. hours per week	34.2	34.6
Tons per man-day ANTHRACITE	7.47	7.75
Men working, average	65,923	56,700
Avg. weekly earnings	\$71.19	\$73.31
Peak weekly earnings	\$85.46	\$91.63
Avg. hours per week	31.5	29.6
Tons per man-day	3.04	3.151

*Through November. †August. ‡Estimated. Sources: USBM; Bureau of Labor Statistics.

Changes in the Railroad Picture

	1952	1953
LOCOMOTIVE FUEL		
Coal, tons	32,288,634	23,300,000*
Liquid fuel, barrels. LOCOMOTIVES INSTALLED FIRST 10 MO.		97,500,000*
Diesel	2,644	1,822
Steam	15	13
Electric	2	0
Gas-turbine electric	6	4

Sources: ICC; Association of American Railroads. *Projected from Aug. 31.

The Coal Export Picture

(Tons)		
	1952	1953*
To Canada	20,951,288	19,500,000
Overseas	26,685,581	14,500,000

Source: Coal Exporters' Association of the U. S. *Estimated.

How Gas Fared

	1952	1953
NATURAL GAS		
Utility sales, million therms	49,293	53,800
Customers (thousands):		
Residential	16,892†	18,310
Commercial	1,377†	1,444;
Industrial	67†	741
MANUFACTURED AND MIXED GAS		
Utility sales, million therms	3,326	3,2404
Customers (thousands):		
Residential	6,680†	5,9821
Commercial	468†	4171
Industrial	37†	32‡

Source: American Gas Association. *Projected from October 31. †Year's average. ‡End of third quarter.

Level Year in '53 . . . Better Times Ahead

No headlines for coal in 1953. Industry makes quiet progress as coal men move to strengthen today's markets and get ready for bright years ahead.

LEVEL GOING throughout the year —that's the bituminous story for 1953.

It was a year with few if any highlights. Bituminous production, at 450,000,000 tons, held nearly even with 1952—only 3.6% down. Prices though painfully low, were fairly steady. The government didn't meddle in industry affairs. There were no big strikes in other industries, like the steel stoppage of 1952, to pull coal tonnage down. Even Mr. Lewis stayed quiet.

But the year was not lost.

If some mines rocked along on short working time, with slim or non-existent profits, others worked at a pretty good clip and, in a few instances, turned an even better profit than in 1952. In short, the industry wound up 1953 with a substantial nucleus of strength.

If markets were sluggish, coal's 2-yr residence on the low-level flats had one healthful effect: a firm resolve and a refreshing new ferment of ideas and activity among coal men aimed at seeking out new customers.

And if the flatlands of 1953 were uninviting, up ahead, in 1954 and the years to follow, men of vision saw slopes leading to higher levels. Now shaken down, tightened up and sparked by a determined approach to its marketing problems, the industry moved into 1954 with new but cautious hope.

Anthracite had less to be thankful for. Badly hurt by warm winter weather, the industry produced only 30,023,000 tons, about 26% less than in 1952. From January through April, the weather in six anthracite-consuming cities was 12% warmer than usual. The October-December heating period was even worse. In fact, one industry spokesman, commenting re-

cently on weather for the past 5 yr, noted that degree-day deficiencies in that period accounted for a total loss of 16,753,000 tons, after full allowances were made for losses to competing fuels.

The Year's Battles

IN THE PUBLIC FORUM, coal fought for fair and reasonable competition.

crusade was directed against rivers of foreign residual oil dumped on the Atlantic Coast at prices that depressed coal markets. In 1953, the flood rose to some 140,-000,000 bbl, against 128,510,000 bbl in 1952. Congressmen from coal-producing states, alerted by their constituents, threw 22 bills into the Congressional hopper, all of them seeking to curb oil imports. These measures, consolidated into the Simpson bill, drew support from railroad workers, equipment manufacturers, domestic oil producers and domestic metalmining interests.

But the foreign oil issue became merged into the larger issue of reciprocal trade and, with pressure from the Administration, failed to pass. Even so, the Foreign Oil Policy Committee, set up by coal interests and others to push the Simpson bill through Congress, survived the battle. At the year's end, it laid down a still stronger line for a new battle in 1954.

Coal also fought on the freight-rate front. Target was a petition by the railroads asking the Interstate Commerce Commission to make permanent the temporary 12% boost granted the rails in 1952. The boost was scheduled to expire Feb. 28, 1954. But on July 30, passing up customary hearings, the ICC extended the in-

crease to Dec. 31, 1955. The record showed that coal freight rates had risen 59.6% since 1946.

Coal men, however, sought ways to beat the freight-rate rap. In March, Pittsburgh Consolidation Coal Co, reported that its coal-slurry pipe-line experiments were successful and began rounding up customers to make a commercial pipe line economically feasible. Elsewhere, more and more coal producers erected river loading docks to increase the movement of coal by barge and interest in overland trucking to consumers resulted in actual establishment of lines by a few producers in 1953.

Coal's Big Users

STEEL AND ELECTIC UTILITIES were coal's best customers in 1953.

Class I electric utilities boosted their power generation from 399,223,-620,000 kw-hr in 1952 to 447,000,-000,000 in 1953—a jump of about 12%—while installed capacity rose from 78,588,141 kw on Dec. 31, 1952, to an estimated 89,728,022 kw at the close of 1953—an increase of over 14%. The utilities' coal burn came very near keeping up, with a rise of 10%.

But the utilities also burned other fuels in growing quantities.

Use of gas by electric utilities rose about 12% over 1952, with the total burn equal to about 40,000,000 tons of coal. That was a sizable increase but, even so, was actually seven percentage points lower than the rate-of-growth figure from 1951 to 1952. This drop-off in the growth rate could be marked up partly to higher prices for gas and partly to expansion of underground storage capacity, which made less gas available on inter-

ruptible contracts with big users. On the oil side, utility use rose

On the oil side, utility use rose 38% above 1952 to equal some 23,000,000 tons of coal. A big share of the increase reflected the abundance of dump-priced residual oil disgorged along the Atlantic Seaboard from tankers serving Venezuelan refineries.

In coke ovens and steel and rolling mills, coal use in 1953 ran about 16% above 1952. For most of the increase, coal men could thank uninterrupted running time in the steel mills, which had lost some 16,000,000 tons of ingots and castings during the 1952 strike.

In the railroad market, coal consumption fell off, with locomotive fuel declining about 28%. Throw in about 7,000,000 tons for station and shop heat and other purposes, and the 1953 railroad total runs to about 30,000,000 tons. The railroads' use of liquid fuel also declined, but only about 1,000,000 bbl. Consumption of heavy fuel oil and gasoline dropped off substantially but the use of diesel fuel rose sharply, confirming the railroads' position as the Nation's top consumer of diesel oil.

Meanwhile, however, the Norfolk & Western Ry. still placed its bets on coal. In January, that railroad authorized construction of 15 coal steamers in addition to 15 already on order, and in July reported that it soon would accept delivery of a 4,500-hp electro-drive steam-turbine locomotive fueled with coal.

Among "Other Industrials"—the consumer group that includes such miscellaneous coal users as textile mills, food factories, industrial power and steam plants and a host of others—the coal burn in 1953 was close to 100,000,000 tons of bituminous, nearly 5,000,000 tons more than in 1952. Cement mills, separately classified, raised their coal consumption from 8,073,000 tons in 1952 to nearly 8,600,000 tons in 1953.

New Attack on Markets

TWO YEARS IN THE DOLDRUMS, for most bituminous men, was enough.

Thus 1953 saw a spurt of activity looking to more coal sales. Coal men set their sights mostly on commercial and miscellaneous industrial users. With a new theme, "Total Selling," the following were major moves during 1953:

January—The Marketing Committee of National Coal Association was enlarged and subdivided into engineering, off-track and on-track task forces. Bituminous Coal Research, Inc., announced that upon request it would set up conferences for engineers interested in smoke and fly-ash, coal-handling and combustion.

April—Coal Heating Service Div., NCA, distributed a 32-unit series of 1½-min radio spot announcements to promote coal.

May-The Marketing Committee offered a monthly listing of construction contracts for plants with power-generating facilities, together with the names of men who might influence the choice of fuel.

June—CHS made available a roster of purchasing agents and promised to revise the roster monthly. NCA joined the American Coal Sales Association in sponsoring a course at Penn State College for industrial coal salesmen. Later in the summer, the same course was offered at Purdue University.

August-CHS offered a set of technical publications to make it easier to sell coal for boilers. Meanwhile, the Minneapolis Minute Men organized to fight, on short notice and in emergency, to keep coal in plants and buildings in the Minneapolis-St. Paul area. Before the year was out, they had announced several installations saved for coal. To help other coal men set up similar groups, CHS produced a small brochure telling how the Minute Men work. Elsewhere, in Illinois, Indiana and Michigan, the Sales Engineering Council was formed to respond to calls for help in holding old customers and winning new ones.

October—CHS issued "Coal Heat Saves Tax Dollars in Public Schools," a booklet showing how and where coal is best. At its annual convention, meanwhile, NCA stressed sales and sales methods and streamlined its advertising, promotion and public-relations operations.

November-Automatic Solid Fuels Equipment, Inc., was organized at Indianapolis to produce, distribute and sell modern equipment. For a starter, the new outfit had the Campbell stoker, a recently developed binfeed automatic-ignition stoker. By mid-November, orders for over 400 units had been booked.

The American Retail Coal Association worked closely with producer agencies. Clinics in Cincinnati, Detroit and Cleveland helped salesmen with such subjects as: "Do's and Don't's in the Boiler Room" and "Trouble - Shooting in the Boiler Room"

Though the strongest pitch was thrown at industrial and commercial markets, retailers and home markets were not neglected. CHS maintained its newspaper advertising and mat services to member organizations and extended them to non-members.

In anthracite, disappointing sales and dwindling profits brought a new combined merchandising and publicinformation program into being. At the start of the year, producers and retailers joined in employing a publicrelations organization to study factors affecting anthracite markets. Before midyear, with findings of the study in hand, all retailer organizations in the industry's marketing area, together with producers, agreed to subscribe to a joint fund to improve service to customers, broaden distribution of automatic heating units and broadcast information about anthracite to the public. The mineworkers' union and makers of burning equipment joined the movement. As part of the effort, Anthracite Information Bureaus were set up in Boston, Philadelphia and New York City.

Besides all this, Anthracite Institute, as in years past, exhibited burning equipment at architects' and builders' shows and in November, joining with chambers of commerce and individual producers, sponsored Anthracite Progress Week throughout the producing region.

With output down, anthracite's best bet for the future appeared to lie in developing industrial markets, in which electric utilities and regional railroads now play the leading roles. To that end, Anthracite Equipment Corp., an AI subsidiary, announced in May that it soon would start production of AnthraAid, a filter aid for use in chemical and food plants. Later, in July, Electric Furnace-Man launched its new Fire-Jet burner for commercial and industrial boilers in the range of 100 to 300 lb per hour.

Markets From Research

RESEARCH - KEY TO COAL'S PROGRESS-continued through 1954.

Bituminous Coal Research, Inc., dedicated its new laboratory March 24 at Columbus, Ohio, and, Aug. 27, moved its local staff into their new quarters. There scientists and technicians renewed their research on automatic steam generators and gasifiers for industry, automatic homeheating equipment, cleaner combustion, block heating, and crop dryers and poultry warmers.

In addition, joined by electric utilities, BCR developed new uses for flyash and revealed the economics of making low-carbon steel in electric furnaces. Fly-ash, BCR reported, is an unexcelled component of concrete block, drain tile and road-surfacing. Used in an experimental 180-ft strip of highway near Pittsburgh, it proved superior to conventional materials for

choking road base and simplifying the handling of surface asphalt.

In making low-carbon steel, a 2-yr study by BCR and utility researchers, released at mid-year, revealed that the electric furnace would be cheaper than the blast furnace, would create new power customers and would call for some 25,000,000 tons of coal per year for power generation.

BCR also filled requests by clean-

BCR also filled requests by cleanair agencies, chambers of commerce and groups of engineers for a dozen or more combustion conferences in various cities. Close to 1,000 engineers attended these discussions.

BCR and its Locomotive Development Committee, having solved all major problems except turbine-blade erosion—and that seemed near solution—enlisted the American Locomotive Co. in a joint project to carry development of the coal-fired gasturbine locomotive into its final stages and design a chassis. Rail tests were scheduled for 1954.

Elsewhere on the research front, Carbide & Carbon Chemicals Co., Institute, W. Va., in September shipped its first tank-car load of chemicals—a high-boiling phenol. Meanwhile, in Milam County, Tex., Texas Power & Light Co. was within a few months of using carbonized lignite to fire boilers at a big station providing electric power for the Aluminum Co. of America.

Cuts in federal appropriations, however, forced abandonment of two government research projects. In April, following conferences with a House committee, Interior Secretary McKay ordered shutdown and disposal of the synthetic-liquid-fuel demonstration plants at Louisiana, Mo. Later, in July, when Congress refused additional funds, Alabama Power Co. closed down the underground gasification experiment at Gorgas, Ala.

In anthracite, the Anthracite Institute extended its development and testing of burning equipment, sought new and better ways to gasify anthracite fines and looked for new fuel and non-fuel uses for anthracite in industry. Glen Alden Coal Co., meanwhile, set up its own laboratory to develop industrial and other uses for anthracite.

Oil and Gas in 1953

FOR OIL AND NATURAL GAS, 1953 was a good year. But there were bumps along the way.

Domestic crude production was up about 5% above 1952, in spite of a slow-down toward the end of the year. Imports of crude, residual and products rose 10% above 1952 while exports dropped 7%. The net exportimport deficit totaled about 350,000,-000 bbl in 1953 against 290,000,000 in 1952.

Crude imports alone marked up a gain of some 18% above 1952, forcing regulatory bodies in six oil-producing states to cut daily allowables by over 600,000 bbl per day between August and December and reducing revenues to producers by about \$1,500,000 per day. Small wonder that independent oil producers—that is, those without foreign holdings—made common cause with coal producers against the tide of oil imports.

Imports of residual fuel oil rose to the equivalent of some 34,000,000 tons of bituminous, 7% above 1952.

Oil prices, in a market unsettled by imports, moved uncertainly through 1953. At mid-year, producers raised crude prices 25c per barrel and refiners on the Atlantic Seaboard lifted gasoline prices 0.8c and No. 2 fuel oil 0.2c per gallon. Residual fuel oil prices rose 15c per barrel at the same time. But one week later, these advances met resistance and were halved. As the fall months continued warm, inventories of petroleum products rose uncomfortably. Prices sagged and refinery operations dropped off about 150,000 bbl per day. In November, Esso Standard cut 0.3 to 0.5c off the price of heating oils along the Atlantic Coast—the first winter-time heating-oil price cut since

As for natural gas, though it held its place as the wonder child of the fuels industry, it and its customers had their troubles. With the Herscher Dome storage pool in Kankakee County, Ill., coming into service, customers in Chicago with interruptible contracts were put on notice that they soon will lose their supplies to storage and that prices for boiler fuel inevitably will rise. Proposals to import gas from Canada and Mexico and export gas to eastern Canada ran into strong opposition. On balance, decisions by the Federal Power Commission indicated that the rapid growth of gas for boiler fuel might be in for a slow-down.

Price-wise, while Texas gas producers and others complained that present prices are unreal, FPC revealed that gas customers of all kinds had to pay from 8 to 10% more in April, 1953, than in the same month a year earlier.

Biggest disappointment to gas men came at the end of the year, when the Supreme Court refused to review the decision of a lower court that directed FPC to regulate field prices of gas destined for interstate pipelines. Ob-

servers believe this decision will hold field prices at low levels.

Labor Scene Peaceful

THE LABOR FRONT WAS QUIET in 1953—or, rather, a good deal less turbulent than in some years of recent memory.

One reason for peace doubtless was that miners were more concerned with maintaining their working time than with striking for additional wage gains and other benefits. Apparently, Mr. Lewis sensed this mood among his men. Also, he must have looked with some concern at big coal stockpiles (at the end of September, utilities held 127 days' supply) and sluggish markets. At any rate, whatever his reasons, he let the Sept. 30 reopening date slip past without giving notice that he wanted a new wage agreement. As the year closed, he still was quiet.

On other issues, Mr. Lewis spoke his mind from time to time. In April, testifying on the Taft-Hartley Act, he demanded again that the law be repealed. He said, in fact, that he would settle for no labor-management law at all, provided the Norris-La Guardia and Clayton Acts were left on the books. In October, joining the celebration of the 50th anniversary of the Anthracite Conciliation Board, he re-stated his doctrine that high wages can come only from high productivity, that investors are entitled to a fair return on their capital and that more and better machines will help the industry.

The UMWA Welfare & Retirement Fund, as of the year ended June 30, reported expenditures of \$139,000,-000, with 226,421 beneficiaries receiving \$135,000,000; income of \$131,000,000; and a reserve of \$92,-000,000. Corresponding figures for the preceding 12 mo were: expenditures, \$126,000,000; income, \$126,-500,000; reserve, \$99,500,000. Some 50,000 miners were reported to be receiving pensions in 1953, with 6,706 new pensioners being added during the year against 8,139 in the preceding year

In April, the welfare fund announced the award of contracts for erection of 10 regional hospitals, totaling 1,040 beds, in Kentucky, Virginia and West Virginia. On July 4, ground was broken for the first of these hospitals at Beckley, W. Va.

In some areas, violence colored attempts of the UMWA to organize non-union operations, notably in Butler and Mercer Counties, Pa.; Clay and Leslie Counties, Ky.; and at Widen, W. Va. In April, while the

UMWA withdrew suits alleging a "reign of terror" in Kentucky, with claims running to \$2,000,000, it was hit with its fourteenth suit in Virginia, the plaintiffs charging that their non-union mines had been forced out of business.

Better Men for Mining

RECOGNIZING THE NEED for trained men, coal's leaders kept a watchful eye on training and recruitment.

Heading the drive in 1953, as in several years past, was NCA's Vocational Training and Education Committee. In January, committee members visited the University of Kentucky; in October, the Universities, they talked with mining professors and officials and reviewed the courses in mining engineering.

In addition to formal committee visits, individual committeemen traveled to other colleges where mining courses are offered. They also addressed technical groups and service clubs on training and the need for skilled men.

Estimates indicate that in 1953 over 120 scholarships were financed by bituminous companies for mining students; in anthracite, a proportionate number.

In Pennsylvania, West Virginia, Kentucky and Ohio, coal-mining courses for high-school students flour-ished helped along by coal companies and operators' associations. In Tennessee, operators set up a series of conferences looking to establishment of similar courses in schools located in mining areas of that state.

Winning Public Favor

FAVORABLE PUBLIC OPINION of coal-that was the aim of much of the industry's activity in 1953.

In bituminous, BCI led the way, seeking, as discussed earlier, to win public support on the oil-import issue and, by case-history advertising and other devices, to proclaim coal's merits as the best fuel for small industrial and commercial installations.

BCI also spoke for coal through its far-flung communications network, prepared articles for business magazines on coal's problems and coal's performance, distributed its 1952 Annual to business and financial writers and newspapers, provided photographs from its extensive files and answered inquiries growing out of advertisements in business and industrial periodicals. Personal follow-up of these inquiries, BCI officials

say, would make a story in itself.

Meanwhile, BCI's Educational Division provided 48 textbook authors and publishers with new text materials and illustrations; 35 lecturers, university teachers and others with data about coal; 18 encyclopedias with new articles or new information about coal; 1,500 school systems with "Coal: Plant Life to Plastics," a visual unit for high-school classrooms; and 70,000 teachers with 833,000 printed aids, including booklets, charts, plays and cutaway views of coal mines.

In the debate on imported residual oil, both the Educational Division and the Speakers' Bureau took a strong hand. The Educational Division in December alone filled requests from 135 university debating teams for information on free trade. The Speakers' Bureau, meanwhile, with 380 coal men listed on its active roster, filled 351 engagements in 1953 in 33 states, the District of Columbia and Canada, carrying coal's case to civic clubs, professional societies, purchasing agents, engineers and other groups. The Bureau also distributed BCI's color film, "Powering America's Progress," for more than 1,000 showings, including over 100 telecasts, between the film's first showing, early in 1952, and the end of 1953. In 1953, this film won a Freedoms Foundation award and a first prize in the public relations section of the Boston Film Festival.

Net effect of BCI's work in many quarters was to set the record straight about coal, its workers, its significance to national strength, its progress and its future.

Making Mining Safer

ANOTHER BANNER YEAR-that's the 1953 safety story.

It was the first full calendar year for the Federal Coal Mine Safety Act, known as the McConnell Act. By the start of 1953, the Bureau of Mines had put its administrative machinery in working order. How much of the credit for a better safety record should be passed to the McConnell Act and the Bureau is not known, because boosts for safety also came from state departments, operators' associations and individual companies. At any rate, there was the record, better than ever. Details are published on p. 90 of this issue.

In the course of the year the Board of Review, set up by the McConnell Act to hear appeals from USBM rulings, filled out its membership and set to work. Washington, North Dakota and Oklahoma signed compacts with the Bureau providing for joint mine inspections. The Bureau trained

50 new inspectors, bringing the total to 275.

In October, the Bureau issued updated versions of the Federal Mine Safety Codes for bituminous and anthracite, following conferences with the mineworkers' union and some operator groups. And in December, the Bureau clarified parts of the code in response to requests from the Southern Coal Producers' Association. By and large, the revisions covered practices, such as roof-bolting, that had been developed since the first code was issued, in 1946.

Everywhere, throughout the year, interest in safety was lively. In West Virginia, for example, there was a revival of interest in and activity by Joseph A. Holmes Safety Association chapters at individual mines. Late in the year, the West Virginia Department of Mines appointed a safety specialist to spur wider interest in the Holmes associations and to work with the USBM in organizing new chapters.

Elsewhere, in most of the large coalmining states, 100% safety training spread. Some of the training was in first aid, some of it in accident prevention. But wherever the emphasis lay, interest ran high and measurable results showed up.

Taking the Long View

WHAT'S THE OUTLOOK for coal? Of all the promises in coal's future, the promise of electric power looms largest.

Thrust out of most kitchens and many basements by competing fuels over the last several years, coal now has re-entered the home as electricity. Electrical World, peering into the future, predicts that by 1962 the average home will use 4,326 kw-hr per year, compared with 2,343 kw-hr in

Strange to say, hot summer weather now is boosting coal consumption to fill air-conditioning needs. Thus the big utilities last August reported new peak summer loads. Mostly, they credited disappearance of the usual summer slump in power consumption to cooling units. In the week ended Aug. 1, for instance, Edison Electric Institute noted that power output across the Nation reached 8,500,000,000 kwhr-250,000,000 kw-hr higher than in the peak week of December, 1952. Consolidated Edison estimated that a summer day in New York City with temperature in the 90's creates need for 375,000 kw-hr more than a day when air conditioning is not needed. This added load, the utility said, requires about 3,000 tons of coal every

If these figures on the effect of air conditioning seem cheerful now, tomorrow's figures will rise to real significance. Recently, the American Institute of Management, taking note that only 100,000 American homes now are air-conditioned the year round, predicted that the figure will exceed 2,000,000 by 1958. And in July, General Electric Co. announced that it soon will begin producing residential and commercial heat pumps in three plants. Twenty-seven public utilities and 100 municipal utilities are pooling their efforts to promote heat pumps and thus increase the power load.

But home use of electricity is only part of the picture.

On the industrial side, use of electric power per man-hour has increased in the past 5 yr from 6.9 to 8.6 kw-hr. Electrical World estimates that by 1962, to obtain the 20% increase needed in the physical volume of industry to supply our population growth and maintain our standard of living at that time, a 40% increase in kilowatt-hours per man-hour will be necessary.

Here are a few details, as estimated by *Electrical World*:

	Power Needs (Billion Kw-Hr	
	1950	1962
Metals, primary and		
fabricated	50.0	106.6
Chemicals	25.3	57.4
Paper and products	18.0	30.0
Transportation equip-		
ment	7.5	21.3
Machinery makers	10.8	35.1

And so on down the line. Titanium, for example, the new wonder metal, requires 20 kw-hr per pound for processing. In 1953, titanium producers in the United States turned out about 3,400 tons, though aircraft manufacturers said they could have used 100,000 tons if it had been available. The Department of Defense actually has recommended government subsidy for an annual capacity of 35,000 tons in 1955.

Elsewhere, on the Minnesota iron range, Reserve Mining Co. is building a 40,000-kw steam station to provide power for processing taconite. This probably is the first in a chain of power plants that will be built in the area. Most of them doubtless will be coal-fired, since coal can be brought in on ore boats as they return to the iron country. Each ton of taconite mined and processed requires about 80 hp of energy.

That small sampling is enough to suggest the shape of the future for electric power—and for coal.

Market Outlook Brightens Because . . .

Utilities Will Grow in 1954

New Coal-Burning Units Scheduled to Go "On the Line" in 1954

	Capacity-		-Estimated Annual- Coal Needs (Tons)	
	Kilo- watts	Coal (Tons)	Predicted Coal Burn	Stockpile Needs
Northeast and Middle Atlantic Seaboard	1,278,000	3,294,000	2,000,000	700,000
West Virginia, interior Pennsylvania and New York	905,000	2,715,000	2,715,000	900,000
Carolinas, Alabama, Tennessee and Kentucky	2,465,000	7,395,000	7,395,000	2,400,000
Illinois, Indiana, Ohio, Michigan and Wisconsin	2,428,000	7,284,000	7,284,000	2,400,000
Iowa, Kansas and Missouri	390,000	1,170,000	600,000	200,000
Minnesota, North Dakota, Colorado and Utah	371,000	1,113,000	910,000	300,000
TOTAL	7,837,000	22,971,000	20,904,000	6,900,000
Source: Keystone Coal Buyer's Manu	al.			

In addition to industrial and home demands for more electric power, the government also, through the Tennessee Valley Authority and the Atomic Energy Commission, is taking on a bigger role in coal consumption. Even now, nearly half of TVA's power is generated in coal-burning steam stations. Within the next few years, when TVA's Shawnee, Widow's Creek, Johnsonville, Colbert, Kingston, Gallatin and John Sevier steam plants come on the line in full strength, TVA will need 18,500,000 tons of coal per year. Meanwhile, big steam stations for AEC, now partly on the line or under construction along the Ohio River, soon will require close to 10,000,000 tons of coal per year.

Somewhat farther in the future lies the promise of sizable coal tonnages for the chemical industry. By 1975, says Dr. George T. Felbeck, vice president, Carbide & Carbon Chemicals Co., demand possibly may soar to 20,000,000 tons per year for the manufacture of aromatic chemicals alone. Other analysts, conceding that reserves of oil and gas may begin to dry up 15 to 25 yr from now, look to coal gasification and liquefaction as the major source of chemicals for the future. By 1975, they see demand for those chemicals that can be produced by the Fischer-Tropsch process rising to 15,000,000 lb per year-six times present demand. To produce those chemicals from coal, Fischer-Tropsch plants would have to turn out 700,000 bbl per day of liquid fuels and would use up to 130,000,000 tons of coal per year.

Looking Ahead in 1954

AN UPTURN IS DUE for coal in 1954.

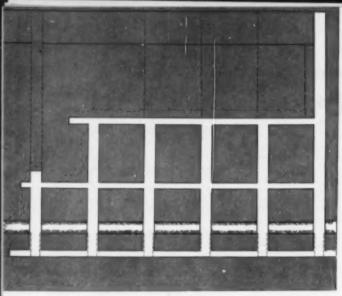
It won't be a sharp upturn. But it may herald the start of better times for the industry,

Much, of course, depends on the level of industrial activity in 1954. On that question, most of the crystalball gazers who, 6 mo ago, predicted a substantial down-turn now take a more cheerful view of 1954. Capital expenditures for plant and equipment, they predict, will hold fairly steady. Automobile production, key to a big fraction of coal demand, will sag little if any. Housing starts will very nearly equal those of 1953. Personal income and employment will stay high and the over-all index of industrial production, if it drops at all, will fall no more than 5%

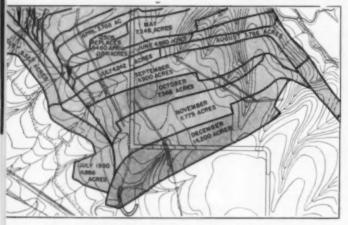
The outlook for 1954, then, is pretty good.

Here's how coal probably will share in that outlook:

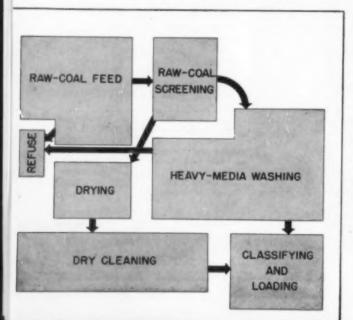
	1954 Coal Demand (Tons)
Electric utilities	130,000,000
Coke ovens, steel and rolling mills	110,000,000
Railroads: locomotive fuel other uses	25,000,000
Cement mills	8,500,000
Other industrials	100,000,000
Retail dealer deliveries	60,000,000
Exports:	
Canada	19,000,000
Overseas	12,000,000
TOTAL BITUMINOUS	464,500,000
ANTHRACITE	30,000,000



LONGHOLE MINING (CA, March, 1953, p 76) was one of the new projections marking efforts to harness costs, Continuous and remotely-controlled mining, longwalling, induced caving and augering also helped.



IMPROVED OVERBURDEN PREPARATION resulted from use of dry-type rotary drills. A change to this drilling at the mine above (CA, March, 1953, p 80), immediately increased drilled acreage per month.



Mining Highlights-1953

Drive for lower costs in deep and strip mining and in preparation sparked by accelerated development and application of new machines and new ideas.

Deep Mining

MORE GIANT STEPS toward increasing efficiency, based in the necessity for cutting production costs, mark deepmining activities in 1953. As the year rolled along, some general trends were revealed, as follows:

- 1 Concentration of production into a minimum number of working places and in the hands of fewer men was increasingly emphasized. The benefits are lower costs for development and maintenance of openings and more economy in providing services such as ventilation, drainage and power distribution. The major drawback to concentration, the damaging effect of outages, was realistically faced with better maintenance and servicing, and the presence of more spare machines for rapid insertion into the production line.
- 2 New designs in machinery were pressed into service in efforts to increase productivity. Witness the increase in the number of continuous-mining machines of all types (about 172 in service or on trial at the end of 1952, about 300 in service or on trial at the close of 1953); the advent of practical units such as the extensible belt or tandem conveyors for speeding up intermediate transportation; the use of crawler-mounted shuttle cars in pillar recovery and moderate-pitch mining as well as in development; the application of variable-speed, constant-feed, self-propelled rotary roof drills and integral roof drills on continuous-mining machines to reduce or eliminate a necessary delay; and the broadening use of four-wheel-drive-and-steer shuttle cars to provide faster, safer room haulage.
- 3 Conventional systems employing conventional units were reworked in a number of instances to increase tons per man-shift without making a huge investment. Worthwhile contributions were made by auxiliary equipment such as new alloy and hard-tipped bits, prefabricated mine track, larger mine cars of conventional materials and also aluminum, hydraulic drills and mechanized road cleaners, to name only a few. Such streamlining paid off at a number of mines, where the increased production today might well permit financing new machines for tomorrow.
- 4 New ideas in American mining continued to crop up. The number of longwall faces equipped with planing

LARGE CENTRAL PLANTS, with modern machines for wet or dry cleaning like the one at left (CA, October, 1953, p 88), were placed in service as a major step toward winning and holding customers. and stripping machines increased, induced caving and longholing were successful in anthracite, and the possibility of mining a longwall with a continuous-type machine continued to intrigue some U. S. operators. Improved models of remotely-controlled mining machines went into additional mining regions in further tests of machines and methods, and underground augering continued to hold attention.

5 Making projections for new mines and territories on the basis of new-machine characteristics, rather than "shoe-horning" the machines into classical methods, was an increasing trend in 1953. Continuous-mining machines proved their ability to retreat pillar sections at a number of mines, where methods were changed slightly to suit the abilities of the machines.

6 Safety performance improved markedly at some mines in proving that 100% training of employees in practical methods of accident prevention really pays off, primarily in increased efficiency (see p 90).

CONCENTRATING OPERATIONS TO INCREASE OUTPUT, CUT COSTS

At a western-Pennsylvania mine, after the first full year of total continuous mining, the record showed that tons per man-shift (total payroll) had increased from 6.5 to 10.0. Production costs were reduced about 72c per ton and face safety showed an impressive improvement. The continuous machines were employed in retreating narrow fracture lines consisting mainly of chain and heading pillars where trouble had been encountered in keeping enough working places for conventional units. Concentration, in the form of continuous mining, was the answer.

Also, there was increased interest in concentration of labor by combining cycle elements such as cutting and drilling, a development which came into favor with the introduction of more hydraulically-powered, handheld drills which can be driven by the hydraulic system of some cutting machines or from a trailer-mounted hydraulic pump in shortwall cutting.

Conveyor mining in many instances has been streamlined and concentrated, as a result of both better utilization of drive-unit power through changes in mine layout and better face preparation through better drilling with improved drills and bits.

NEW MACHINE TYPES HELP SOLVE PROBLEMS

Several types of extensible belts, cascade conveyors and so on have been offered as possibilities for speeding up transfer of coal from face to main haulage.

One company, now conducting tests with an extensible belt, sees opportunities for perhaps doubling the length of rooms, thus reducing by half the number of butt entries required. Much high-cost development thereby will be eliminated, along with the necessary haulage equipment for these butts. This new unit, equipped with self-propelled head and tail units, it is felt, can be effectively extended to 600 ft.

Aluminum troughs and carrier frames for shaker conveyors were a 1953 entry. In an anthracite application, this new design permitted longer advances from one setup, eased the labor of handling conveyor parts and reduced deadwork. Less weight and corrosion resistance are big features.

Improved roof-bolting drills continued to make their weight felt as more and more companies realized that bolting actually could open up hitherto unminable reserves. Superior dust collectors, better rock bits and improved bolts were effective with better methods in providing safer roof control.

Prefabricated stoppings and overcasts saw wider application as the rate of section recovery increased, and recoverability of these auxiliary supplies became more important as factors in their design and in their acceptance at the mine.

Conveyor mining in a continuousroom system benefited through the
design and use of a new mobile continuous conveyor. The object was to
eliminate from the working cycle the
18 man-minutes required to add each
pan to the conveyor line. The solution
was to mount a fully-assembled 310ft-long room conveyor on 7-in caststeel wheels, with the drive unit in a
special head assembly on rubber tires.

RESTYLED CONVENTIONAL MINING ADDS TONNAGE

In Oklahoma, where natural conditions favored the system, one company uses loading machines, cutting machines and shuttle cars on 315-ftlong faces to eliminate frequent place changes and increase productive time for the loading machine. Chain conveyors are used in entry development and in opening up new long faces for the high-tonnage equipment. In brief, the system consists of mining 70x315ft blocks by continuous slabbing off the outer ribs of two adjacent rooms. Cutting, drilling and loading are simultaneous operations, the only interruption occurring when the men are withdrawn for shooting. The seam is 36 in thick.

What Continuous Miners Are Producing Today

Com-	Coal Thickness	Condi- tions	Tons per Man
1	96	Difficult	20.0
2	40	Average	20.0
3	42-56	Very Diff.	22.0
4	54	Difficult	32.7
5		Average	50.0
6		Average	20.9
7	64	Average	23.7
8		Good	47.0
9	50	Adverse	27.0
10	70	Average	29.5
11	70	Average	32.1
12	84	Average	35.5
13	73	Average	28.7
14	48-54	Average	28.0
15	102	Good	41.9
16	48-56	Average	50.0
17	44	Average	29.0
18	42	Average	29.0
19	96-144	Difficult	23.7
20	42	Average	15.8
21	44	Average	13.8
22	96	Average	26.8

Total machines in summary: 58
Tons per man, weighted average: 28.2

A West Virginia variation on the conventional theme has merit for the well-equipped small mine or the mine still in development. In this instance, the emphasis is on scheduling the crews to insure distributed loading and effective cleanup and mainte-nance over the 24 hr. At this mine, 16 men report for the first shift to prepare and load coal in the normal manner. Nine men report for the second shift, working on supplies and maintenance for the first half of the shift. Then they are joined by seven others and the remainder of the shift is given over to normal production. At the end of the second shift, the seven men remaining in the mine to complete their shifts and a third-shift crew of nine men continue normal operations until the 7-man special crew completes its shift. The nine men remaining then return to supply, maintenance and preparation work in order to get the first shift off to a good start.

NEW IDEAS APPLIED IN BITUMINOUS AND ANTHRACITE

In 1953, increasing interest was shown in longholing and induced caving as feasible methods for raising anthracite productivity. The bituminous industry closely studied longwalling as a possibility for greater economy and high recovery in exploiting thinner seams.

Development of better bits, designed especially for longhole meth-

ods, along with continuing studies of roof action as related to drilling patterns, have resulted in refinements of longhole methods which mean cleaner coal and reduced consumption of explosives. Induced caving has proven successful at one colliery, according to reports, and colliery officials now are refining this method of mass recovery with the goal of reducing rock dilution.

Furthermore, a continuous-mining machine has showed up in anthracite to be used mainly in development of long gangways. While haulage problems remain to be licked, it is reported that the machine is cutting satisfactorily.

Roof-support developments in anthracite include the use of roof bolts at a number of mines and the installation of full-circle yielding steel rings in a squeezing section of an important haulage tunnel to reduce the high cost of keeping the tunnel open by retimbering. First reports on performance of the steel rings are encouraging.

In bituminous, all stops are out. Longwalling with planing and stripping machines has made possible the economical recovery of otherwise marginal areas. Two systems of remotely-controlled mining have passed the Buck Rogers stage of development, having proven their worth in penerating highwalls with surprising results, productionwise. Even dial telephones showed up underground.

CENTER STAGE: NEW PLANS FOR MODERN MINING

Continuous production, from face to railroad car, is the governing thought as coal-mine designers in 1953 looked ahead to the mines and plants which will be required to produce tomorrow's coal. On the drawing boards are systems and designs which will permit fuller realization of the high capacity in new machines. New projections for the use of augers and remote-control machines have been drawn up. More efficient haulage systems for both coal and supplies are being worked out. The travel-time problem is under constant examination, with new portals, improved mantrip dispatching and even self-propelled man-cars.

In the Illinois No. 6 seam, one mine has developed methods using 100% continuous mining for recovering pillars, an unusual practice in this area. More and more planners and designers for new mines are reexamining traditional methods to be certain of their compatibility with new machines. In this regard, very little was taken for granted in 1953.

New Bituminous Preparation Facilities in 1953*

Coal Company	100 m	Plant Location	Capacity, TPH	Preparation Equipment
	177	(550	/Haworth ¹
Alabama By-Products	Corp	Maxine, Ala		Western Machinery
		Praco, Ala. (10)	100	Deister Concentrator
Alabama Power Co		. Mobile, Ala	60	Haworth ¹
Altmire Bres. Coal Co.		. Apolla, Pa	200	Jeffrey!
Armee Steel Corp	********	Nellis, W. Va Toms Creek, Va	50	Roberts & Scheefer
Banner Fuel Co Bell & Zoller Coal Co.		Johnston City, III.		Deister Concentrator
Berwind-White Coal N	lining Co.	. Maryland, Pa	30	Dorris
Blue Diamond Coal Co			400	McNally Pittsburg
		Leatherwood, Ky	60	Link-Belt ¹⁰ [Fuel Processing ¹¹
Bortz Coal Corp	********	Point Marion, Pa	60	Kanawhall
Bridgeview Coal Co		. Fayette County, Pa.	160	Jeffrey!
Cinderella Ceal Co		Hatfield, Ky	50	Jeffrey ¹³
Clearfield Bituminous	Coal Corp.	Indiana, Pa	150	Wilmot ¹³
Clinchfield Coal Corp.		Byrne, W. Va Owings, W. Va. (3)	75	Roberts & Schaefer
Consolidation Coal Co	. (W. Va.).	Byrne, W. Va	300	Fairmont ¹⁴
		Owings, W. Va. (3)	180	Fairmont ^{II} Roberts & Schaefer ²
Crescent Coal Co Crichton Coal & Coke		. Central City, Ky	50	Daniels ^{is}
				Roberts & Schaefer
Crucible Steel Co	*			Heyl & Patterson ¹⁷
David Z. Norton Co		. Pewhatan, Ohio	150	Nelson L. Davis ¹⁸
Denise Coal Co		. Somerset, Pa	75	Roberts & Schaefer
				(Kanawha ¹³
Eastern Gas & Fuel A	seciates	Wharten, W. Va	300	McNally Pittsburg!! Heyl & Patterson!!
Emerald Coal & Coke	Co	. Milisboro, Pa	15	Heyl & Patterson®
Ethel Chilton Mines.		Ethel, W. Va	300	McNally Pittsburgs
Grafton Coal Co		Clarksburg, W. Va		Fuel Processing ¹¹
				Kanawha ^[1]
Greensburg-Connellsv	ille Ceal &			Heyl & Patterson ²³
Coke Co		McKeesport, Pa	500	Jeffrey
Harlan Fuel Co				Deister Concentrator
Harmar Coal Co		Harmarville, Pa.	25	Heyl & Patterson®
Harmon Creek Coal Co		. Burgettstown, Pa	30	Fuel Processing ¹¹ Kanawha ¹¹
Imperial Coal Co		Clymer, Pa	50	Roberts & Schaefer
inland Steel Co		Wheelwright Kv.	300	Link-Beit ^{ss}
Jacobs' Fork Pocahon		Squire, W. Va. (2)	120	Fairmont ^N
Jacobs Fork Fotanon	tas Coar Co	Squire, W. Va. (2) Squire, W. Va Farmington, W. Va.	75	Jeffrey ⁵
Jamison Coal & Coke	Co	Farmington, W. Va.	216	Derris
		Hostetter, Pa	6	Darril Roberts & Schaefer ¹⁰
Jenkins Coal Mining			150	Kanawha ³¹
Jewell Eagle Coal Co Jewell Ridge Coal Corp	********		76	McNally Pittsburg
Jeanne Coal Co		Rachel, W. Va	55	Roberts & Schaefer
				Haworth ²⁵
Kentucky Fuel Co		Hellier, Ky. (3)	30	Deister Concentrator
Kaiser Steel Corp		. Sunnyside, Utah		Dorris
Lion Coal Co		. Wattis, Utah	20	Roberts & Schaefer ^D
Mahan-Ellison Coal Co	orp	Lancing, Tenn Milburn, W. Va	130	Jeffrey
Milburn By-Products		. Milburn, W. Va	50	McNally Pittsburg®
North Branch Coal Co	rp	Kitzmiller, Md	20	Deister Concentrators Daniels
Nugent Mining Co		Luthersburg, Pa	60	Robt, Holmes&Bres.11
Oglebay, Norton & Co.	*********	N. Industry, Ohio		Robt. Holmes&Bros.15
Ozark Philpott Mine.				Deister Concentrator
Pardee & Curtin Lumi	bee Co	. Bergoe, W. Va		Roberts & Schaeferil
			(100	Delster Concensrator
		(Harco, III. (10)	127	Link-Belt ¹⁰
Peabody Coal Co		. (1 10	Heyl & Patterson ³²
	_	DuQuein, III	90	Link-Belti
Pennsylvania Water &	Power Co.	Safe Harbor, Pa	12	Heyl & Patterson®
Perry Coal Co		O'Fallen, Ill		Roberts & Schaufer'
Peters Creek Coal Co.		. Summersville, W. Vil	240	Deister Concentrator
Pocahontas Fuel Co		Amonate, Va	600	Fairmont
rocamentas Fuel Co		Bishop, Va. (2)		Link-Belt ³³
		- Dienop, 500 (0)	240	Deister Concentrator
Reitz Ceal Co		. Central City, Pa	35	Dorrell Heyl & Patterson ³⁰

Strip Mining

To reduce mining costs and overcome increasingly difficult mining conditions, coal strippers along with manufacturers, concentrated their efforts on methods and equipment that would yield more output. Shovels and draglines continued to share the spotlight at most operations, while tractorscraper units saw special applications. More power and higher capacity were required as more and tougher overburden was removed. Contour stripping continued as the leading method in bituminous, and deep-cut work with overburden hauling was predominant in anthracite.

OVERBURDEN PREPARATION

Better overburden preparation to permit stripping units to move more material with less effort received spe-

New Bituminous Preparation Facilities in 1953*

Coal Company	Plant Location	Capacity, TPH	Preparation Equipment
		(150	Fairmont ^M
	Ernest, Pa	48	Deister ConcentratorN
	Eritore, Factorial	1 6	Heyl & Patterson ³⁴
Rochester & Pittsburgh Coal Co	Four States, W. Va.	50	Deister Concentratarii
modification of the state of th	McIntyre, Pa. (2)		Deister Concentrator
	Lucerne Mines, Pa.		Deister Concentratorii
Rasedale Coal Co	Morgantown, W. V.		Roberts & Schaufer
Roslyn Cascade Coal Co	Ronald, Wash, (2).	20	Deister Concentrator
Revalty Smokeless Coal Co	Cliff Top, W. Va		Roberts & Schaefer
	(Praise, Ky. (4)		Deister Concentrator
Russell Fork Coal Co	Praise, Ky	*******	Heyl & Patterson ²²
Saminale Coal Corp	Lenzburg, III	250	McNally Pittsburg ¹¹
W. P. Stahlman	Corsica, Pa	180	Jeffrey ⁶
	Appalachia, Va	/170	Wilmatii
Stenega Coke & Coal Co	Apparaenta, va	50	Deister Concentrator ¹⁰
Sun Ray Coal Co	Caryville, Tenn	65	Roberts & Schaeferil
Tasa Coal Co	Zelienopie, Pa	90	McNally Pittsburg®
Truax-Trace Coal Co	Velva, N. D	560	McNally Pittsburg
Unientown Coal Mining Co	Uniontown, Ky. (8)	120	Deister Machine®
United States Steel Co	Robena, Pa. (3)		Deister Concentratorii
	1 1 1 1 1		[Jeffrey ⁽⁾
	(Shrewsbury, W. Va	300	Kanawha ^{si}
Valley Camp Coal Co	Cedar Grove, W. Va		Kanawhaii
	Triadelphia, W. Va.	25	Heyl & Patterson ³³
West Kentucky Coal Co	Madisonville, Ky (2) 30	Heyl & Patterson ¹⁰
West Virginia Coal & Coke Corp.	Omar, W. Va	200	Fairmont
Milliano Alex Cool Co	Imperial, Pa. (3)	30	Deister Concentrator
William Aloe Coal Co	Imperial, Pa	5	Heyl & Patterson ⁽⁾
Wynn Coal & Coke Co	Fairchance, W. Va.		Jeffrey [§]
Yankeetown Deck Corp	Yankeetewn, Ind.	800	McNally Pittsburg"

*Includes contracts for installations of new preparation equipment in existing structures. Where more than one equipment item was installed, the number, when known, is in parentheses after the plant address.

1. Heavy-density plant and concentrating tables.

2. Wemco Mobil-Mill.

3. SuperDuty Diagonal-Deck tables with Concence revolving feed distributors as follows: Alabama By-Products, 2: Harmar Coal, 4; Kentucky Fuel, 1; Peabody Coal, 2; Pocahontas Fuel, 3; Rochester & Pittsburgh, McIntyre, Ernest, Kent, one each; Russell Fork, 1. 4.

nest, Kent, one each; Russell Fork, 1. 4.
Complete coal-handling system. 5. Jeffrey
unit washery.
6. Jeffrey Baum jig. 7. Complete finecoal cleaning plant, including R&S SuperAirflow cleaners. 8. Super-Duty Diagonal
Deck coal-washing tables. 9. Complete Deck coal-washing tables. 9. Complete dense-media plant including two McNally Tromp dense-media units, Deister Concentrator tables, thermal drying, vacuum fil-ters and th'ckeners. 10. Multi-Louvre

driers.

11. Kanawha-Belknap calcium-chloride
washer, 12. Fine-coal drying facilities, 13.
Wilmot (HM) coal cleaner. 14. Chance
coae system. 15. Baughman Verti-Vane cone system. 15. Baughman Verthermal driers.

16. Daniels DMS dense-media

16. Daniels DMS dense-medla system.

17. Water-clarification equipment with filters and auxiliary equipment, including Heyl & Patterson cyclones. 13. Neldco packaged heavy-media plant. 19. Complete washing plant, including McNally Norton wash box, CMI driers, Raymond fash drier, water clarification system equipped with Heyl & Patterson cones and 9-disk Eimeo divers. 29. Cyclone thickness.

filter. 20. Cyclone thickener.
21. Including McNally Tromp densemedia washer. 22. Reineveld centrifugal

drier, 23. R-O-M dumping, picking and conveying equipment. 24. TwinDeck Ameri-can pneumatic separators. 25. Hydrotator

equipment:
26. Heated-deck acreens and conveying
equipment. 27. Including McNally Norton
unit washer, Gearmatic crushing and stoker
reacreen facilities. 28. Fine-coal cleaning
plant including three Delsier SuperDuty Diagonal deck tables with Concenco revolving feed distributor. 29. McNally Norton unit washer. 30. Leaby double-surface screen. 31. Hydro-Separator. 32. Including Prins

31. Hydro-separator. 32. Including trans washer, 33. Complete preparation facilities including two Chance cones, Delster Con-centrator SuperDuty Diagonal-Dock tables, three Conceno revolving feed distributors, centrifuges, Multi-Louvre driers. 34. Includ-

centrifuges, Multi-Louvre driers, 34. Including Chance cone system, SuperDuty Diagonal-Deck tables with Concence revolving feed distributor and cyclone thickener installation, 35. Leahy vibrating screen with FlexElex screen heating units.

36. Concence revolving feed distributors.

37. Complete facilities including Jeffrey Baum Jig, centrifugal driers and thermal driers, 38. Including McNally Tromp densemedia washer.

39. Wilmot heavy-density system with Concence revolving feed distributor, 40. Including Deister Machine coal-washing tables with one revolving feed distributor.

41. Including coal-storage system consisting of 1,000-ton Armeo storage bin and

41. Including coal-storage system consist-ing of 1,000-ton Armco storage bin and Jeffrey Baum jig. 42. Including river load-ing plant. 43. Including SuperDuty Di-agonal Deck tables, Heyl & Patterson cy-clone thickener and Reineveld centrifugal drier. 44. River loading facilities, includ-ing McNally rotary breaker and screening facilities. 45. Dorr thickener.

STRIPPING

cial attention in 1953. Vertical drytype rotary drills marked new advances as cover became heavier. A significant increase in the number used in anthracite was evident where holes were drilled up to 150 ft deep. Sidewall units continued to see widespread use where cover was comparatively light. Emphasis also was placed on better drilling patterns as a method to get maximum efficiency from explosives.

Higher-capacity shovels and draglines equipped with modern power units permitting a faster work cycle registered new gains in 1953. Additional power and capacity were packed into the smaller two-crawler units. Emphasis continued to be placed on the use of special highstrength lightweight alloys in dipper, bucket and boom construction. Earthmoving equipment of all types found increased use for coal hauling, spoil hauling and reclamation work.

Special recording instruments mounted in all types of equipment instruments were used as aids to machine operators to help them increase output. Among these were load-indicators showing shovel operators when dippers were full, and degree-of-swing recorders indicating the amount of swing per pass.

Overburden haulage continued on a large scale in anthracite open-cut stripping with high-capacity enddump trucks preferred for the job. Rock wagons and special rock-hauling units also handled large quantities of overburden.

Scrapers and bulldozers, working in conjunction with shovels, removed a sizable share of the overburden in bituminous mines and saw additional service in spoil haulage in both anthracite and bituminous.

Combination rubber-tired sweeper and pneumatic drill units continued to gain favor for preparing coal for loading. Where coal could be loaded without shooting, a pump capable of removing small bodies of water was sometimes mounted on the sweeper unit in place of the drill.

TRANSPORTATION

The end-dump truck and the tractor-trailer continued to be the primary haulage method. Entering the picture was the overland beltline for carrying coal from the loading pit to preparation plant. Well-constructed and properly drained roads with good alignment and grade became more prominent as haulage units increased in speed and size. More attention was given to preparation of road beds and road mainte-Automatic traffic signals nance. speeded haulage where strip roads crossed highways.

AUGERING

Highwall augering output registered new gains in 1953. Maximum depth of holes drilled remained around 200 ft. Production usually was carried out on two shifts per day, 5 days per week, with coal being stockpiled when preparation plants were idle. Augers continued to be used primarily in conjunction with strip mining but sometimes were used to recover the coal beyond the highwall in previously abandoned pits, or coordinated with deep and strip mining for the most economical overall recovery of coal.

STRIPPING AUXILIARIES

Auxiliaries were geared more and

New Anthracite Preparation Facilities in 1953*

Ceal Company	Plant Location	Capacity	Preparation Equipment
Atkins Coal Co	Frackville, Pa. (2)	36	Wilmet ¹
C. M. Bixlar	Valley View, Pa	15	Wilmot ¹
Cain Coal Sales	Shamokin, Pa		Wilmet ¹
Centralia Mining Co	Centralia, Pa	24	Wilmeti
Cyclone Coal Co	Branchdale, Pa	58	Deister Concentrator
D & Z Coal Co	Shamokin, Pa	47	Menzies ¹
DeAngelis Ceal	Carbondale, Pa		Derril .
Di Rengo Coal Co	Minersville, Pa. (2).		Menziesi
Erie Centracting Co	Wilkes-Barre, Pa	10	Heyl & Patterson ¹
Gilberton Coal Co	Gilberton, Pa		Wilmet [†]
Glen Alden Coal Co	Kingston, Pa		Wilmet ¹
Indian Head Coal Co	Pottsville, Pa	50	Heyl & Patterson ¹
		200	Wilmet ¹
Jedde Highland Coal Co	Jeddo, Pa	20	Derrii
		10	Heyl & Patterson ¹
Lookard Coal Sales	Shamokin, Pa	15	Wilmet ¹
Moffat Coal Co	Taylor, Pa		Menzies
O'Brian Coal Co	Suedburg, Pa	7	Menzies ⁱ
		/ 99	Wilmet ¹
Penag Coal Co	Good Springs, Pa	20	Monziesi
Reidinger Coal Co	Paxines, Pa	7	Menziesi
Schnock Coal Co	Suedburg, Pa		Wilmeti
Stoudt's Ferry Preparation	Lessport, Pa. (2)		Delater Concentrator!
Swatara Coal Co	Mineraville, Pa		Western Machinery ¹⁵

*Includes installation of new preparation units in existing structures. The num-ber of units, where known, appears in pa-rentheses following the plant address.

1. Wilmot Hydrotator, 2. Wilmot Sim-ex jigs. 3. Wilmot froth-flotation plant, including conditioners and 6-cell Agitair froth-flotation machine. 4. Concenco revolv-ing feed distributors. 5. Menzies cone sepation equipment.
6. Cyclone thickeners, 7. Wilmot heavy

density system with Wilmot (HM) coal cleaner; Wilmot froth-flotation plant, including conditioner and 6-cell Agitair froth-fiotation machine. 8. Wilmot Hydrotator and two Wilmot Hydrotator-Classifiers. 9. and two Wilmot Hydrotator-Classifiers. 9. Wilmot Hydrotator, Wilmot Hydrotator-Classifier and Wilmot froth-flotation plant with conditioners and 6-cell Denver Sub A flotation machine, H. & P. cyclone thickener. 10. Wemco Mobil-Mill. 11. SuperDuty Diagonal-Deck coal-washing DorrClone, 13. Hydroseparator. table.

more toward conserving manpower and increasing production time from all units. Rapid communication betweeen the pit and the shop or supervisor continued to move forward as FM radio units became more widespread. Specially - equipped fieldmaintenance trucks and maintenance specialists reduced down time on strip and loading units. Special tire-maintenance centers, also manned by experts, increased tire life. High-capacity pumps capable of pumping in any position provided efficient water handling in anthracite. Stream diversion and flumes were used as methods to reduce inflow to pits.

Preparation

Emphasis on fine-coal cleaning again was in the foreground in 1953. Fine-coal cleaning, centrifugal and thermal drying, and filtering marked up new gains. Heavy-media, flotation, wet and dry tables and cyclones also registered gains, as did modern central washers for cleaning coals from several mines.

COARSE-COAL CLEANING

Gains were registered in heavymedia, dense-media, sand flotation, jig and upward-current equipment. Special crushers to reduce hand picking, and larger raw-coal storage bins received increased attention. Two-stage separation along with crushing and recirculation of middlings continued to move forward. The top size normally cleaned remained at about 6 in, although units sometimes were designed to handle 8-in or larger material. Better rock ejection from cleaning units was developed for anthracite plants handling large quantities of

FINE-COAL CLEANING

Increased emphasis in both anthracite and bituminous was focused on fine-coal cleaning. Tables, special upward-current washers and classifiers, special jigs, heavy-media units and flotation machines all attracted increased attention. Predrying of coal before tabling aided dry cleaning.

Additional emphasis was placed on recovering fine coal from silt and slurry ponds by using flotation units or cyclones and filters. A portable flotation plant was developed for recovery of fines from old ponds, slurry dumps, or fines in existing plants normally discarded because of conditions unfavorable to installation of fine-coal cleaning additions.

More attention was directed toward closing preparation-plant circuits by installation of such units as settling cones, cyclones and filters; cyclones and vibrating screens; or solid-bowl classifiers and centrifuges. Greater

stress on water neutralization was evidenced by addition of automatically controlled water-conditioning units to control acidity of plant water.

DEWATERING AND DRYING

New gains were achieved by mechanical and thermal drying units in 1953. Centrifugal units in combination with heat driers, or centrifugal units alone, were handling coal to %-in top size. Heat driers were used for final drying of coal up to 11/2-in top size.

Coarse-coal sizing and refuse dewatering usually were handled by shaking and vibrator units. Stationary stainless steel screens with 1/2-mm openings were used in scraper conveyors to help mechanical dewatering units handling stoker sizes.

SIZING AND LOADING

Vibrating screens continued to make gains for dewatering and sizing in 1953. Further popularity was noted for heated screen cloth to prevent screen blinding and to improve screening efficiency. Crushing, blending and rescreening units also registered new

Tramp-iron removal and dustproofing with oil and chemicals found increasing use. Coming into the picture for the first time were cylindrical screens that use centrifugal force from rotating and gyrating motions to increase screen efficiency.

PREPARATION SERVICES

Alloys and stainless steel continued to gain in favor as materials for lining chutes, conveyors and the like as protection against acid water and abrasion. Ceramic materials were used to line units subject to abrasion and where there was no impact, such as, cyclone apexes, centrifugal driers and sand-flotation cones. The use of rubber and plastic pipe increased for handling abrasive or corrosive water.

Dust-collecting equipment vacuum - type manually operated cleaning units gained in favor as more effort was directed toward reducing plant dust, particularly near motors and electrical controls. Dusttight and moistureproof motors and controls marked up further gains as did centralized lubricating systems. Duplicate pumping systems were installed to assure continuous plant operation.

For refuse disposal the truck remained the favorite, with increasing emphasis being placed on larger heavy-duty units as haulage distances increased.

Equipment Sales in 1953

By W. H. YOUNG, Chief, Bituminous-Coal and Lignite Section, and R. L. ANDERSON, Commodity Industry Analyst,
U. S. Bureau of Mines, Washington, D. C.

Table I—United States Bituminous and Lignite Production by Methods of Mining and Mechanical Cleaning

	19	51	19	52	1953 °		
	Thousands of Net Tons	Per Cent of Total	Thousands of Net Tons	Per Cent of Total	Thousands of Net Tons	Per Cent of Total	
Surface stripping		22.0	108,910	23.3	107,000	23.8	
Hand-loaded underground Mechanically loaded underground		21.0 57.0	87,431 270,500	18.7 58.0	74,000 269,000	16.4 59.8	
Total production		100.0 45.0	466,841 227,265	100.0 48.7	450,000 237,000	100.0 52.7	

Table II—Underground Bituminous and Lignite Production, by Methods of Loading

	195	1	195	2	1953 °		
	Thousands of Net Tons	Per Cent of Total	Thousands of Net Tons		Thousands of Net Tons	Per Cent of Total	
Mobile-loading machines:							
Loading into mine cars	102,591	24.7	75,605	21.1		2	
Loading onto conveyors	11,229	2.7	11,079	3.1		8	
Loading into shuttle cars	138,843	33.4	132,297	37.0		3	
Continuous-mining machines	1	8	8,215	2.3	2	2	
Augers	1	1	1,506	0.4	2	2	
Scrapers	126	0	77	8	8	1	
Conveyors with duckbills or other							
self-loading heads	13,884	3.3	10,590	3.0	2	2	
Hand-loaded conveyors	37,583	9.0	31,131	8.7	2	2	
Total mechanically loaded	304,256	73.1	270,500	75.6	269,000	78.4	
Hand-loaded	111,791	26.9	87,431	24.4	74,000	21.6	
Total underground produc- tion	416,047	100.0	357,931	100.0	343,000	100.0	
APP - M - I		9.7-	Asian Andread	company and	ach and action to	anded W	

Preliminary.

Included with mobile loading machines.

Included with mobile loading machines.

Table III—Mechanical-Loading and Conveyor Units Sold for Underground Use, As Reported by Manufacturers

	1948	1949	1950	1951	1952	1953	Per Cent Change From 1952
Bituminous and Lignite:							
Mobile-loading machines	723	286	289	287	306	180	+19.9
Augers	1	11	1	1	1	57	1
Scrapers ³		8	1	4	8	11	+37.5
Shuttle cars	8	543	465	524	428	437	+2.1
Conveyors:							
"Mother"	230	116	132	114	67	58	-13.4
Room or transfer	1,025	394	316	297	155	87	-43.9
Face ^j	356	160	116	111	76	49	-35.5
Pennsylvania Anthracite:							
Mobile-loading machines	2					1	****
Scrapers1		10	8	8	5	3	-40.0
Shuttle cars			***				
Conveyors:							
"Mother"	5		1				
Room or transfer	184	147	57	34	34	16	-52.9
Face ⁽	18	5		8	13	2	-84.6
Number manufacturers reporting	22	22	20	21	22	25	****

1 Not available. Total number of augers sold

1946-52, inclusive, was 271.

¹ Reported as scrapers or scraper haulers and

hoists.

³ Total number of shuttle cars sold 1936-48, inclusive, was 2,849.

4 Conveyors are classified as to the length the power unit has capacity to take: "Mother," capacity over 500 ft; room or transfer, capacity 100 to 500 ft; feee, capacity under 100 ft.

100 to 500 ft; face, capacity under 100 ft.

⁵ Includes "bridge" conveyors, beginning in 1950.

SHIPMENTS of mechanical-loading equipment for underground use in coal mines in the United States, in terms of capacity, were 14% more in 1953 than in 1952. The capacity of mechanical-cleaning equipment sold for use at bituminous mines was 20% less in 1953 than in 1952. Shipments of shuttle cars for use in coal mines in the United States increased 2% in 1953 over 1952, while all conveyor shipments decreased during the same period.

This survey was made possible by the courteous cooperation of all known manufacturers of mechanicalcleaning equipment for bituminous mines and manufacturers of mechanical-loading and supplementary haulage equipment for use in all coal mines in the United States. Data from various trade journals also were utilized.

Mechanical-loading units and supplementary haulage equipment "Sales in 1953" represent shipments made during the year. Of the total capacity of mechanical-cleaning equipment sold in 1953, 27% was placed in operation during that year. The remainder will be installed later.

Mechanical Loading

Bituminous and lignite mechanically loaded in underground mines decreased from 304,255,921 tons in 1951 to 270,499,656 in 1952, or 11%. Mechanical loading in Pennsylvania anthracite mines decreased from 10,-847,787 tons to 10,034,464 in 1952, or 8%.

Table I shows data on bituminous and lignite production, by methods of mining, and mechanical cleaning for 1951-53, inclusive. The percentage of this total output mechanically loaded and mechanically cleaned continues to increase. During 1953 approximately 84% of the total output was either mechanically loaded at underground mines or loaded by power shovels at strip mines.

Underground production of bituminous and lignite, by methods of loading, is shown in Table II. Production by continuous-mining machines and coal-recovery augers is shown separately for the first time

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Table IV—Sales of Mechanical-Loading Equipment in 1953, Compared With Machines in Active Use in Preceding Years

	1946				in Active e Operato 1950		1952	1953 Sales, Reported by Manufac- turers
Bituminous and Lignite:								
Mobile-loading machines		3,569	3,980	4,205	4.318		4,083	180
Continuous-mining machines			3,500	4,200	8,010	4,410	152	67
Augers							61	57
Scrapers	75	67	56	46	39	22	19	11
Pit-car loaders	93	71	37	17	12	1	1	2
Conveyors with duckbills or other self-loading heads	1,521	1,531	1,632	1,483	1,329	1,242	1,049	8
Hand-loaded room conveyors (number of units) Pennsylvania Anthracite:	3,470	3,979	4,125	4,312	4,434	3,904	3,569	87
Mobile-loading machines	27	25	19	27	30	43	54	1
Scrapers	564	594	643	589	556	528	456	3
Hand-loaded room conveyors (number of units)4	3,233	3,457	3,562	3,618	3,460	3,282	3,232	16

Canvass of pit-car loaders in use discontinued in 1951.
Canvass of sales of pit-car loaders discontinued in 1945.
Sales of conveyors equipped with duckbills or other self-loading heads

are included with hand-loaded room conveyors.

Includes pit-car loaders and conveyors equipped with duckbills or other self-loading heads.

Table V—Mechanical Loading Equipment in Use in 1952, With 1953 Sales

	Mobile Loaders		Continuous Miners		Augers		Scrapers		Room Conveyors ¹	
	In Use in 1952	Sales in 1953	In Use in 1952	Sales in 1953	In Use in 1952	Sales in 1953	In Use in 1952	Sales in 1953	In Use in 1952	Sales in 1953
Bituminous and Lignite:										
Alabama	130	8	6	2			1		201	1
Alaska	1		0					6	2	
Arkansas					0.6			0 0	68	
Colorado	34	1	4				1		239	
Illinois	367	4	18						22	
Indiana	121	7		3					2	
Iowa	1								3	4.4
Kentucky	483	18	10	2		5			537	17
Maryland					8	1			14	
Montana	26								11	
New Mexico	16						1		2	
North Dakota	4									
Ohlo	194		11	3	8	11			76	6
Oklahoma	5								145	* *
Pennsylvania	938	40	71	40	5	8	8	4	815	7
Tennessee	28	2				2			76	
Utah	124	. 8	2	2				1	76	
Virginia	148	22		2	1	2			155	5
Washington			8	1			8		96	
West Virginia		65	23	12	42	28			1,864	51
Wyoming	35	5	2						214	
	4.083	180	152	67	61	57	19	11	4,618	87
Pennsylvania Anthracite		1		-			456	3	3,2322	16
	4,137	181	152	67	61	57	475	14	7,850	103

Includes hand-loaded conveyors and conveyors equipped with duckbills or other self-loading heads.

in 1952. Practically all auger mining is done along the highwalls at strip mines and the tonnage is included with underground mechanically loaded coal. The preliminary figures for 1953 show that 78% of the underground output was loaded mechanically. The remaining 22% was hand-loaded into mine cars.

Types of Units Sold. Table II lists the number of mechanical-loading and conveyor units shipped for underground use at all coal mines in the United States, 1948-53 inclusive. Shipments of mobile loading machines and continuous-mining machines together increased from 206 in 1952 to 248 in 1953, or 20%. Sales of continuous-mining machines and coalrecovery augers are shown separately in 1953 for the first time. Shipments of scrapers and shuttle cars increased 8 and 2%, respectively, from 1952 to 1953. "Mother," room or transfer, and face conveyors all decreased in 1953.

Exports of underground mechanical-loading equipment in 1953, in terms of capacity, amounted to 15% of the shipments to mines in the United States, compared with 41% in 1952.

Types of Mechanical - Loading Equipment Sold Compared With Units in Use. Table IV shows the trend in demand for various types of mechanical-loading equipment.

Table V shows the number of mechanical-loading units shipped to various states in 1953 compared with the number in use in 1952, as reported by mine operators. Sales of room conveyors as listed in Table V are not exactly comparable with the number of room conveyors in use. To avoid duplication in tonnage mechanically loaded, the mine operator was instructed to report "hand-loaded" and "self-loading" conveyor tonnage only. Therefore, room conveyors loaded by mobile loaders are not included with "Room Conveyors in Use in 1952."

Haulage Equipment

Shuttle Cars. Sales of shuttle cars increased from 428 in 1952 to 437 in 1953. Details of shipments to various states in 1952 and 1953 are given in Table VI. There were 3,844 shuttle cars in use in bituminous and lignite mines in 1952. Details of the number of cable-reel and battery-type shuttle cars in use, by states, 1951-52 inclusive, are given in Bureau of Mines Mineral Market Summary No. 2222, p 26. Exports of shuttle cars decreased 52% in 1953 from 1952.

Face Conveyors. A face conveyor is 10 to 100 ft in length and is used parallel to the face of the room to move material along the face to a room conveyor. Table III lists total sales, 1948-53 inclusive, and Table VI lists sales, by states, for 1952 and 1953. Data on number in use are not available.

"Mother" Conveyors. For the pur-pose of this study, a "mother" conveyor is defined as a sectional, extensible, power-driven conveying un: that can handle over 500 ft of conveyor. Main-slope conveyors are excluded. Table III lists sales, 1948-53, inclusive, and Table VI shows shipments by states, in 1952 and 1953. In 1952, 358 bituminous mines used 308 mi of "mother" conveyors. Detailed data by states on "mother" conveyors in use, 1945-52 inclusive, are given in Bureau of Mines Mineral Market Summary No. 2222, pp 26, 28. Exports of "mother" conveyors decreased 50% in 1953 from 1952.

Mechanical Cleaning

Reports from 21 manufacturers of bituminous-cleaning equipment show that the total capacity of 1953 sales was 7,000 net tons of clean coal per hour, compared with 8,700 tons capacity sold in 1952, a decrease of 20%. Sales in 1953, by type of equipment, in terms of capacity, show that dense media ranked first, fol-

Table VI—Sales of Face Conveyors, Shuttle Cars and "Mother" Conveyors, 1952-53, by States

	Face Conveyors ¹			ittle irs	"Mother" Conveyors	
	1952	1953	1952	1953	1952	1953
Bituminous and Lignite:						
Alabama			35	27		3
Colorado	3		5	2		1
Illinois			14	17	14	12
Indiana				6	* *	4.4
Kentucky	13	8	42	49	17	5
N. Mexico					2	15.4
Ohio			4	7	1	
Oklahoma	. 4		2			3
Pennsylvania	10	1	127	140	6	14
Tennessee			2	2		
Utah			7	10	1	1
Virginia		1	24	45		1
West Virginia		39	166	118	26	18
Wyoming				14		
Total	mo.	49	428	437	67	58
Pennsylvania Anthracite		2				
Grand total	-	51	428	437	67	58

Includes "bridge" conveyors and all other conveyors 10 to 100 ft in length.

Table VII—Bituminous Coal Mechanically Cleaned in 1952, Compared With Sales of Mechanical Cleaning Equipment in 1953, by States

		1050		Annual
	Number of Plants in Operation	Net Tons of Cleaned Coal	Per Cent Output Mechanically Cleaned	Capacity of Equip- ment Sold, Net Tonsi
Alabama	43	9,801,444	86.1	499,000
Alaska	2	265,529	38.7	3
Arkansas				3
Colorado	5	1,485,290	41.0	****
Illinois	69	36,402,615	79.5	496,000
Indiana	27	12,935,513	79.1	
Kansas	3	1,174,053	57.9	****
Kentucky	76	27,710,824	41.9	1,187,000
Missouri	10	2,578,768	87.3	
Montana	2	104,150	5.0	***
New Mexico	1	143,681	18.9	****
Ohio	27	14,771,814	40.8	2
Oklahoma	5	628,083	28.6	4444
Pennsylvania	89	40,740,4143	45.7	1,921,000
Tennessee	6	406,720	7.7	2
Utah	6	2,497,890	40.7	3
Virginia	33	7,786,248	36.1	1,205,000
Washington	16	821,788	97.3	2
West Virginia	205	67,009,8064	47.3	3,486,000
Undistributed			****	435,000
Total	625	227,264,630	48.7	9,229,000

Based on average days mines were active in 1952 and 7 hr per day.

³ Included in "Undistributed."

Includes some coal mined in Pennsylvania and cleaned in Ohio, and a small tonnage mined in

other states and cleaned at a consumer-operated

plant in Pennsylvania. ⁴ Includes some coal mined in West Virginia and cleaned in Penusylvania.

lowed by jigs and wet tables. The capacity of all types of equipment sold in 1953 for cleaning bituminous by wet methods was equivalent to 4% of the bituminous cleaned by wet methods in 1952. Approximately 60% of the total capacity of cleaning equipment sold in 1953 was for additions to present installations. The remainder comprised new plants.

Table VII gives data on bituminous cleaned in 1952, by states, and the annual capacity of equipment sold in





TRAINED MEN and exploitation of safety potential in methods and equipment were keys to fewer accidents in 1953.

Safety-New High in '53

A NEW HIGH IN COAL-MINE state to the constitutionality of the SAFETY was in the making as 1953 drew to a close.

At the end of the year, preliminary figures showed a total of 457 fatal accidents in bituminous and anthracite, against 548 in 1952. The combined rate per million short tons mined in 1953 was 0.95, compared with 1.08 in 1952.

In bituminous, the rate for 1953 was 0.87 fatalities per million tons mined, against 0.96 in 1952. The rate in anthracite also improved: 2.13 per million tons in 1953 compared with 2.44 in 1952.

Only one major disaster marred the record for 1953. In March, five men were killed by carbon-monoxide poisoning following an explosion in an Iowa mine. That disaster came close on the heels of a challenge in that Federal Coal Mine Safety Act of 1952, especially the ban on black

NOT LUCK, BUT HARD WORK

The industry's improved record was not a happen-so. It was the fruit of patience, hard work, training, promotion, cooperation, safer mining methods and better equipment. And everybody who gained by the record had a share in its improvementproducers and their organizations, miners and their union, federal and state agencies and equipment manufacturers.

With falls of roof and face, haulage and electricity the big killers, all groups and individuals moved in to cut the toll. The following are some of the specific steps taken in 1953:

MAKING ROOF AND FACE SAFER

For the far-range future, brightest hope for elimination of roof accidents as well as others lay in the advent of remotely-controlled mining machines, which require no machine operators underground. But, to repeat, that is a distant hope.

For the present, the industry continued to rely on solutions closer at

Operators increased their use of roof bolts and, profiting by the experience of earlier years, found new ways to adapt roof bolts to specific needs and cash in on the resultant opportunities for better mining methods. In many mines, bolting was incorporated into the face cycle, thus keeping roof safe up to the face. Elsewhere, to keep bolting up to the

U. S. Coal-Mine Fatalities During 1953 and 1952*

	_	— Bitu	minous			-An	thracite			— То	otal	
	Fatalities		R	ate1	Fatalities		Rate1		Fatalities		Ratel	
Cause and Location	1953	1952	1953	1952	1953	1952	1953	1952	1953	1952	1953	1952
Falls of roof and face	232	239	0.52	0.51	43	45	1.43	1.11	275	284	0.57	0.56
Haulage	78	101	0.17	0.22	2	17	0.07	0.42	80	118	0.17	0.23
Explosions: Local	4	5	0.01	0.01	5	4	0.17	0.10	9	9	0.02	0.02
Major	. 5	6	0.01	0.01					5	6	0.01	0.01
Explosives		5	0.01	0.01	1	4	0.03	0.10	5	9	0.01	0.02
Electricity	12	10	0.03	0.02	2		0.07		14	10	0.03	0.02
Machinery	8	15	0.02	0.03		2		0.05	8	17	0.02	0.03
Mine fires		4		0.01						4		0.01
All other	3	4	0.01	0.01	7	13	0.23	0.32	10	17	0.02	0.03
Total underground	346	389	0.77	0.83	60	85	2.00	2.09	406	474	0.85	0.93
Surface	26	35	0.06	0.07	4	8	0.13	0.20	30	43	0.06	0.08
Stripping	21	25	0.05	0.05	4 +	6	****	0.15	21	31	0.04	0.06
Grand total	393	449	0.87	0.96	64	99	2.13	2.44	457	548	0.95	1.08

^{*} All figures are subject to revision. | Fatalities per million short tons.

face, roof drills were mounted on continuous miners. The absence of conventional timbers and props provided more working space for men, machines and haulage units.

Increasingly, operators found that plastic coatings applied after bolting would protect roof from exposure to air and thus prevent spalling.

Revisions in the Federal Mine Safety Code, worked out jointly by the Bureau of Mines, the miners' union and some operator groups, set new standards for practice and procedure in roof-bolting. In addition, the Bureau certified as permissible an electrically-driven dry dust collector for use with roof drills, suplementing wet methods that had been approved for some years. Meanwhile, in Pennsylvania, liberalization of that state's mining code permitted operators to use roof bolts without conventional timbering and opened the way for some roof-bolting in anthracite mines. Likewise, the spread of long-hole mining in anthracite reduced exposure of workers to falling roof in pitching

IMPROVING HAULAGE

To combat the haulage toll, signal blocks and automatic switching found wider application. Individual producers, modifying their haulage equipment to reduce hazards, turned out a special supply car with built-in safeguards for motorman and triprider, an automatic pneumatic brake that presses against a slope roof to halt runaway cars, and a special cab to protect shuttle-car drivers, to mention only a few ingenious adaptations.

For shaft mines, a manufacturer introduced a hoist phone for instant communication between hoist engineer and cage. For belt mines, manufacturers offered newly designed drives and idlers, improved fire-fighting equipment and automatic belt controls.

MASTERING ELECTRICITY

To reduce electrical hazards, coal producers installed more automatic controls and circuit breakers, fireresistant cables with tougher sheathing and heavier insulation, safer power-distribution equipment, central control panels and selenium rectifiers. Meanwhile, they turned their in-genuity to making familiar equipment safer. One operator, for instance, mounted a hydraulic drill on a nonhydraulic shortwall cutter, thus eliminating the danger of shock to drillers.

CONTROLLING GAS AND DUST

To prevent explosions and guard against asphyxiation and silicosis, producers, the Bureau, individual com-

panies and equipment manufacturers made new moves. In eastern Kentucky, for example, a federal mine inspector and an association safety director teamed up to design and install a simple but new rock-duster driven by the drill compressor, thus making it possible to put rockdusting into the face cycle. Meanwhile, one manufacturer brought out a new line of dust-measuring instruments, a new bolt-hole cleaner with cyclone and filter, and a methane recorder. Another introduced a new, permanent, automatic carbon-monoxide detector.

Revisions in the Federal Mine Safety Code played a strong role in the fight on dust and gas. The up-dated code, issued in October, prescribed rock-dusting to within 40 ft of the face (against 80 ft in the old code), forbade new installations of booster fans, banned black powder and, as pointed out earlier, authorized the use of dry dust collectors. Under the Federal Coal Mine Safety Act, the new Board of Review, with its full complement of three members, ruled on several appeals protesting classification of mines as gassy by the Bureau.

New mining laws in Illinois and revisions in the Pennsylvania state code were aimed at the same targetprevention of explosions and protection of workers' health.

Producers, especially in anthracite, where anthracosilicosis has become the basis for a growing number of compensation claims, strengthened their efforts to abate dust and studied its occurrence and its effects continuously with scientific care and sensitive equipment.

CHANGING MINING METHODS

Concentration of working areas was a key move in reducing the accident rate. More and more, operators found that concentration of men and machines pays off not only in higher efficiency but also, by simplifying ventilation and providing closer supervision, in improved safety. In addition, concentration means that men are exposed to a given area of roof for a shorter time and that there is correspondingly less danger of their being pinned down by falling roof. The same might be said for new techniques that speed pillar extraction.

TRAINING MEN

Improved mining methods, new machines and equipment, state and federal regulations-all these were big helps to safety in 1953.

But mining men almost everywhere accepted the fact that these alone were not enough. The principal ingredient in safety remained, as always, safety know-how on the part of workers and a conviction among them that safety pays off for everybody, including themselves.

To that end, safety training took on a new spurt in 1953.

Who led the parade? Everybody

In some areas, notably the tri-state corner of West Virginia, Virginia and eastern Kentucky, 100% training of workers and company officials in accident prevention brought gratifying results, with one company cutting its frequency rate by 90% and multiplying tons per accident 13 times. Bureau of Mines men taught the course, joining with company and union officials to flush the men out for classes. Meanwhile, reports of company safety directors before professional groups told how company after company has perfected its classroom and on-the-job training methods, reached more men and marked up new highs in safety.

The National Safety Council in November noted the growing cooperation in safety drives by the miners' union in bituminous and anthracite. The union also shared in putting new life into local chapters of the Joseph A. Holmes Safety Association in West Virginia, Pennsylvania and elsewhere. Joining the effort, the West Virginia Department of Mines assigned one of its inspectors to help organize new

Holmes units.

PROMOTING SAFETY

To put safety in the headlines and honor new safety achievements, individual companies and operators' groups across the Nation staged banquets and celebrations and, with teamwork from state and federal agencies and the union, ran off safety competitions that reached their climax in the National Safety Meet at Ft. Wayne, Ind., in October.

Other safety developments in 1953 included the following:

1. Three states-Washington, Oklahoma and North Dakota-signed jointinspection pacts with the Bureau under the Federal Coal Mine Safety

2. The Bureau added new inspectors and engineers to its staff, bringing the total to 275.

3. Reports from West Virginia revealed that methane can be bled off successfully-and perhaps commercially in some areas-through boreholes from the surface.

4. Mining men in West Virginia and Pennsylvania looked with growing alarm at establishment of naturalgas storage pools beneath and near active mines and began a campaign for legislative control of such facilities.

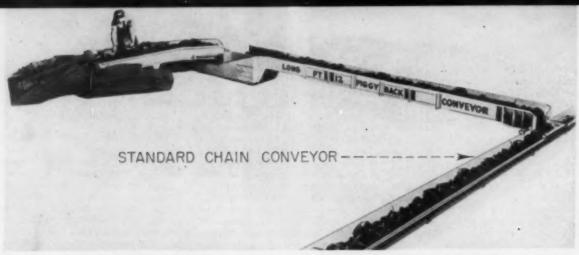


FIG. 1—HOW THE BRIDGE CONVEYOR is used with conventional loading machines to provide continuous transportation and permit the operator to concentrate on loading. High efficiency in a limited area is a characteristic of the system.

Better Continuous Mining With

How conveyor equipment can fit into continuous mining . . . What it can provide in increased tons per man.

By J. B. Long, President, The Long Company, Oak Hill, W. Va.

CONVEYORS as the logical haulage medium for continuous mining have predicted consistently thoughtful observers. Slowness in the development of successful conveyorapplication practice undoubtedly has retarded the progress and development of continuous mining as a system. Is there available, now, a practical conveyor system applicable to continuous mining? How the bridge conveyor (Fig. 1), now widely used with conventional mining units, meets this test of practicality with economy is the subject of this discussion.

Since haulage for mobile loaders in full-seam mining, with its high surge rate, erratic movement and production of large lumps and slabs, is more demanding, there is every reason to conclude that the bridge-conveyor, or Piggyback, system can easily deal with the uniform product and rate of production characteristic of continuous mining. Fig. 2 compares pictorially the types of coal encountered in continuous mining and conventional mobile loading.

Table I is an example of the results attained with the system in conventional mobile loading. This table summarizes time-study results of 5 hr and 58 min of actual loading time in a single 8-hr shift. It is a reflection of the high loading efficiency in a con-

fined area characteristic of the system. In continuous mining, preparation and tramming delays would be eliminated, and the performance shown in the table would not only be improved but would be maintained more consistently.

CONVEYOR DEVELOPMENT

Returning to the subject of conveyors in general, it might be asked why they have not become more popular in continuous mining. Intensive study suggests the following answers:

 Unsuitable Equipment – The practicality of existing conveyor systems proved in conventional mining has been largely overlooked.

2. Lack of Experience and Study—Since continuous mining has not yet become popular in the thinner seams, many of the mining men who know most about conveyor application have had the least opportunity to use their knowledge. Also, there have been sufficient differences in the application of conveyors to continuous mining, compared to conventional mining, to result in these differences being considered problems rather than opportunities. This article will demonstrate, for example, how moves may be made from room to room without delay or separate moving cost.

3. Lack of Surge Capacity-Good

conveyor practice demands close attention to points where one conveyor dumps onto another. Conveyors must be interlocked or sufficient surge-bin capacity must be provided to eliminate the possibility of jam-ups. Surge capacity avoids the problems involved in interlocking and spillage behind the miner when the conveyor stops unexpectedly, and thus is the logical answer. Lack of this surge capacity has been responsible in a large measure for the lack of success in applying conveyor systems to continuous mining today.

4. Opportunities Overlooked-Conveyor application has important but frequently overlooked advantages in reducing section overhead labor cost. Conveyor use will remove the common limitation of one production unit per loading point. Conveyor application also extends the economical haulage distance and thus can make possible mining of larger panels through deeper rooms. Thus, it may be possible for one foreman, one mechanic and one off-shift supply crew to take care of two production units instead of one. Likewise, one development crew may do the work of two when rooms are deeper, including handling of entry rock, belt or track setup, stoppings, loading points, feeder installations, etc.

The saving of one supervisor, one mechanic, one supply man, and one development man might thus be typ-

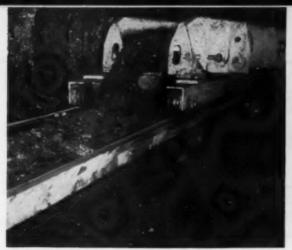




FIG. 2—UNIFORMITY of continuous-miner product, compared to product of conventional loader (right-note large lumps), facilitates application of bridge units in continuous mining.

Conveyor Haulage

ical where two continuous-mining units loading onto conveyors in deeper rooms replaced one unit with mobile transportation and a single loading point. When it is realized that this would have the same result on section cost as a reduction of two men per face crew, there is an important added incentive for making conveyors work. Pressure for economical haulage should come from the top, since executives can more readily appreciate the consequences and the ease with which 40 tons at the face may become less than 10 tons per man at the railroad car.

In review, the advantages of continuous-flow equipment for continuous mining, particularly the bridgeconveyor system, stack up as follows:

Fewer delays.
Higher capacity.
Lower maintenance.
Fewer men in face crew.
Fewer nonproductive men.
Less down time.
Better cleanup.
Better operator attention.
Greater concentration of mining.
Longer economical haulage disneces.

DESIGN FOR CONTINUOUS MINING

In our study of the application of the bridge-conveyor system to continuous mining, we solicited suggestions as to how best to adapt the system for maximum results. We received these worthwhile ideas:

Provide hopper capacity.

Make unit self-loading for cleanup.

Make unit self-tramming for quick

Make unit jointed for turning crosscuts from narrow places.

Provide sufficient additional reach so that room-conveyor extensions can be made in full crosscut lengths.

To meet these additional specifica-

tions, the most practical approach seems to be a tandem unit. A mobile self-loading conveyor embodying hopper capacity for use with the bridge conveyor as a single machine is shown in Fig. 3. This unit is designed to receive coal directly from the miner without any floor pickup except in cleanup. With its receiving end directly under the miner discharge, it needs be moved only at approximate-

Table 1—How Bridge Conveyor Provides High Loading Time in Conventional Mining

One 12-BU loader Two Long bridge conveyors Two Long room conveyors Two shortwalls, 8-ft bars Two rooms, 50 ft wide Coal height, 42 in Estimated output, 310 tons Crew, 7 men

			- Time in	Minutes -		
	Loading Coal	Portal	Changing Places	Splicing Loader Cable	Changing Cars	Prepara- tion Delays
10:45				* *	**	
11:04		19				
11:35	31					
11:41			6			
12:24	43	4.0				
12:45					21	
1:02	17					
1:06			4			
1:10	* *		* *			4
2:22	72	1.5				
2:29	2.2			**		7
2:35			6			
3:40	65			**	* *	* *
3:47		4.4	7	* *	* *	**
4:35	48				* *	**
4:40			**	5	* *	**
5:01	21	**	**	3		
	21	* *	2.5	4.0	1. 1	**
5:07		4.5	* *	4.4	* *	6
5:13		* *	6	* *	9.0	* *
6:06	53		**	4.4	**	
6:14			8			4.4
6:25	* *					11
6:33	8		* *			
6:45		12	**	4.4	**	
480	358	31	37	5	21	28

For additional information on this installation, see "Non-Stop Face Haulage," Coal Age, November, 1951.

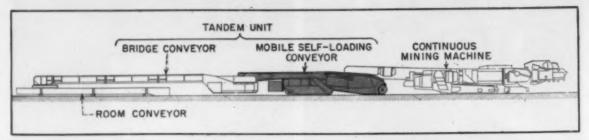


FIG. 3—DESIGN FOR CONTINUOUS MINING includes a supplemental mobile self-loading conveyor in tandem with the bridge unit to provide surge capacity and other advantages.

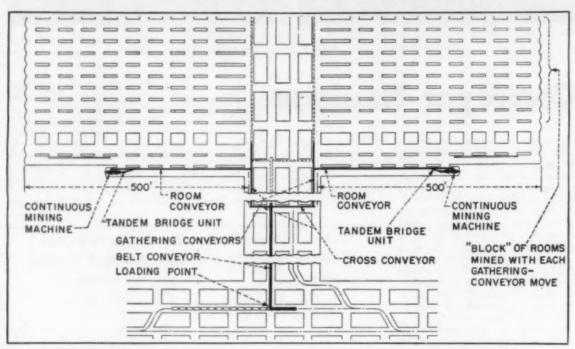


FIG. 4—CONTINUOUS MINING with bridge-conveyor equipment—multiple production units and deeper rooms with a single loading point.

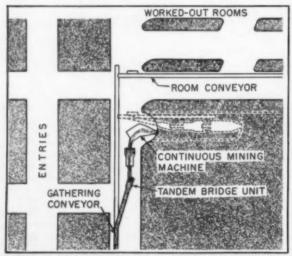


FIG. 5-STARTING ROOM, with tandem conveyor unit.

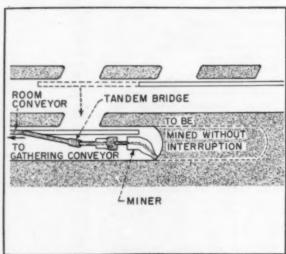
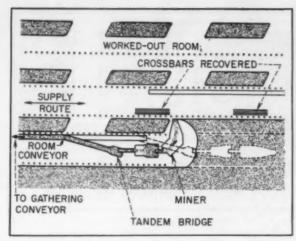


FIG. 6-EXTENDING the room conveyor.



MINER LOADING DIRECTLY
ON ROOM CONVEYOR

ROOM CONVEYOR

TANDEM BRIDGE UNIT
(CLEANING UP)

FIG. 7-SUPPLY HANDLING with conveyor service.

FIG. 8-CLEANUP simultaneous with mining.

ly 6-ft intervals, with no mining inter-

Conveyors Remove Continuous-Mining Limitations—In explaining the application of the bridge-conveyor system to continuous mining, Fig. 4 illustrates a mining plan practical for conveyor transportation. Two miners are shown working on a single but entry and driving rooms 500 ft deep. Compared to one production unit per loading point, this doubling of the rate and quantity of coal handled obviously will cut overhead costs drastically. For example, use of a belt conveyor in the entry handling twice the coal at twice the rate, makes that individual setup four times as efficient.

Continuous mining has outstanding inherent advantages over conventional methods. These are largely the result of (1) the ability of the miner to work "continuously" in a single narrow room for an entire shift, making possible a greater concentration of production than ever before, and (2) improved roof control as a result of elimination of shock to the top, quick recovery of individual rooms (at a. rate of approximately 100 ft or more of advance per shift), narrower room widths, etc. Where roof conditions previously limited room depth, these limitations may be extended substantially by the improved roof control provided by continuous mining. Thus, 500-ft rooms, as shown in Fig. 4, would drastically cut development overhead costs.

At this point, it is again worth noting that conveyor transportation permits the miner to continue to work full time at full capacity even though the depth of the rooms is substantially greater, and that use of conveyors permits two mining units per loading point. The capacity of continuous miners undoubtedly will increase, further enhancing the advantages of the longer reach and continuity provided by the conveyor.

CONTINUOUS MINING WITH THE BRIDGE CONVEYOR

How the bridge-conveyor system meets situations involved in the use of the mining system illustrated in Fig. 4 is detailed in the material which follows:

Starting Rooms-Use of the Tandem Piggyback, or bridge conveyor, with its long articulated reach, permits the starting of rooms (Fig. 5) at angles up to 90 deg off the gathering conveyor. This long reach provides the better part of a shift's work and makes possible the easy transfer of the room conveyor from its location in the previous room without delay in face operation. Thus, a move from one room to another involves only the delay in tramming the miner from one position to another. No delay at all is involved in moving the conveyor. This is the simple solution to one of the most irksome problems in applying conveyors to continuous mining. Special equipment and special mining plans are not required.

Extending the Conveyor—The tandem unit provides up to 70 ft of reach in any direction from the room conveyor. This is utilized, as shown in Fig. 6, to permit continuous conveyor operation for a distance equal to normal crosscut centers, plus the driving of the crosscut itself. Thus, the crosscut distance is automatically based on conveyor-extension length, or vice versa.

This automatic logical spacing of advance and crosscut distances results in more-convenient routine handling of supplies and "panning up," accessibility to the face, working room for personnel, etc. It would normally mean 60 to 70 ft of miner advance without interruption, or the better part of the shift. Therefore, it would be normal to have only one—or at the most two—interruptions of the haulage system during the entire shift. As will be seen, these interruptions can be limited to not over 5 to 10 min each.

Automatic, regularly spaced periods also are provided for the necessary normal maintenance of the miner, such as, greasing, changing bits, etc. Thus, haulage delays are eliminated with resultant increase in efficiency and production.

Supply Handling and Individual Room Moves-Crew setup, supplyhandling arrangements and the like will depend upon individual conditions. To illustrate how this might be done, however, see Fig. 7. Four men might comprise the face crew: operator, two timbermen and one supply man. After each conveyor extension, the miner would drive a crosscut to the previous room. Timbering would be maintained in the previous room to maintain a supply route. Supplies for each crosscut advance would be parked at the anticipated crosscut locations. Thus, every time the miner breaks through into the previous room, the supply man has immediately at hand all the materials necessary for the next advance. This results in the shortest-possible handling distance. Note that the supply man is always operating ahead of the transportation system and that the crosscuts provide him extra room in which to work.

The preceding system contrasts with handling supplies over the trans-

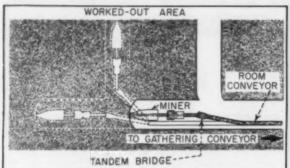


FIG. 9-WIDE-CENTER DEVELOPMENT with tandem unit.

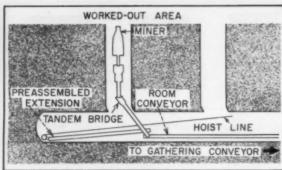


FIG. 10-SUPPLY HANDLING with room hoist.

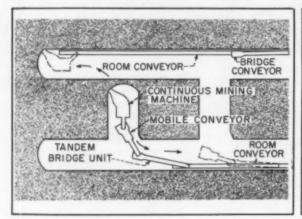


FIG. 11-DRIVING two places simultaneously.

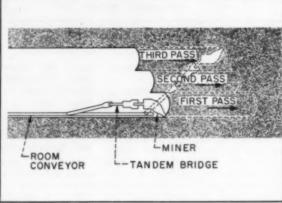


FIG. 12-WIDE-ROOM WORK with tandem-unit service.

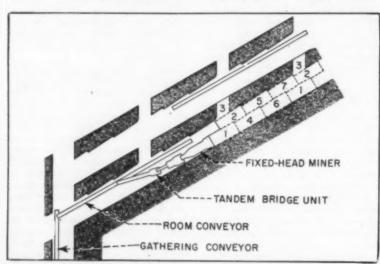


FIG. 13-HOW TANDEM UNIT can work with fixed-head machines.

portation system in cramped quarters in bringing materials up behind the unit in the same room. Note also that in the latter system supplies must be handled by men normally assigned to other duties, who would have to move the materials over the top of operating machinery, creating an undesirable diversion of operator attention.

In contrast, under the proposed system, the only other duty of the supply man is preparing to "pan up." In this, he simply transfers the individual pans and chain from their previous location 25 ft away—closer than any off-shift crew could place them for him—and preassembles pan, chain and extra tailpiece into a single

unit equal to the desired extension. Then, when the miner completes its advance cut, it drops back to provide extra working room. The operator utilizes this regular interval for greasing, changing bits, etc. The two timbermen help the supply man in breaking the chain on the conveyor, removing the tailpiece, and barring into position and reconnecting the presassembled extension for another advance and crosscut.

If the conveyor extension is prefabricated as described here, there will be fewer interruptions compared to putting in one pan in a normal conveyor face. It will not be difficult for the supply man to make up this extension along with his other duties in the 4 to 5 hr or more he has available for the job.

Depending upon the timbering system and the like, a separate recovery and supply crew is normally used in present installations with conventional transportation. For example, if steel crossbars are installed on 3-ft centers, this crew recovers the bars from previous rooms and places them on the rib as close to the face of the room being worked as possible. Other supplies, such as timbers, brattice, etc., would be similarly handled by the crew.

Note that such a crew must operate off-shift to avoid interference with transportation and that two-shift miner operation might result in handling supplies as much as 200 ft to the face. The proposed system is based on maintaining timbering in the previous place and using it as a supply route. Thus, a separate recovery and supply crew could operate on one of the production shifts without interference, while the opportunity for placement of supplies ahead of actual mining would result in minimum handling distance for the face crew.

Use of a mobile supply truck would be especially convenient in the handling and placement of supplies. When not employed by the supply crew, this truck might prove invaluable as an aid to a mechanic handling two or more production units.

Simultaneous Cleanup—Cleanup is the most underrated problem in continuous mining. Where efficient cleanup is even attempted in present installations, it involves the use of a pickup loader, which drops back and cleans up at intervals, causing delays at the face, or a special loading crew which goes into the room and cleans up after mining is completed.

It seems evident that efficient cleanup must necessarily be a separate operation. Fig. 8 illustrates a method permitting cleanup along with mining at the face and providing mechanical cleanup to the last crosscut in all cases. Each time the room conveyor is extended, the continuous-mining machine can load directly onto the pan line for a distance of 12 to 15 ft. During this interval, the tandem bridge unit drops back and loads coal ripped from the face but not cleaned up by the miner.

It is a common feeling that future continuous miners will do a better cleanup job. However, if future machines are going to produce coal at a higher rate, the quantity of coal ripped from the face and thrown bevond cleanup range will increase. Emphasis on fastidious cleanup, either in terms of machine design or operator attention, will reduce efficiency in terms of tons per minute. Turning the machine loose with maximum operator attention on mining, with cleanup as a separate function performed at regular intervals simultaneous with mining, provides the ideal solution.

Moving Costs—A block of rooms in this suggested system is mined for each gathering-conveyor move. It has been demonstrated in the preceding material that individual room moves within this block are made with the regular face crew with no interruptions in production. There is therefore no separate moving cost in individual room moves.

Moving costs would logically be determined by balancing the tonnage from the block against the cost of moving the gathering and cross conveyors to the next block. The gathering conveyor and short cross conveyor can be moved quickly, especially in view of the quantity of mobile equipment available to help with the job. Four man-shifts would be a generous allowance for this operation. Assuming 5-ft coal, production from a block of 10 rooms, with crosscuts, would be 16,000 tons or more. Moving costs, based on 4 man-shifts, would be approximately ½c per ton.

would be approximately %c per ton.

Dependability and Equipment

Maintenance—Up-to-date figures on
maintenance of conveyor equipment
used with mechanical loaders indicate
a cost—materials and labor—of not
over 6c per ton. It may be further
pointed out that chain-conveyor dependability and efficiency can be obtained from new equipment designed
for mechanical production.

Wide-Center Development and Pillaring—In driving rooms and entries on wide centers, the tandem unit has particular advantages through providing longer reach for driving crosscuts from one side, as shown in Fig. 9. This long, articulated reach is particularly beneficial in pillaring also, because angles up to 90 deg away from the pan line are readily spanned.

Fig. 10 shows an alternative method of handling supplies in which a room hoist is used to tow supplies from room neck to face. Pans and chain could be reassembled into regular extension lengths before towing. In retreating or pillaring, they could be taken off and handled in multiple lengths in the same manner.

Driving Two Places Simultaneously-Fig. 11 shows an arrangement for developing two places with one continuous-mining machine, one mobile conveyor, two bridge units and two room conveyors. It will be noted that when the miner breaks through the pillar between the two places it can proceed directly to the face of the second place, loading directly to the room conveyor for a period of time. The mobile conveyor can drop back to the first place, clean up, park the bridge unit, and assist in towing supplies to the face in the interval before it is needed as part of the conveying system in the second place. It will be possible to avoid all pan-up delays, since conveyor extensions are made in the "off" room.

Wide-Room Work-Some applications will call for the mining of extremely wide rooms, as in the potash fields of New Mexico where it can be done virtually without timbering. Fig. 12 shows a method whereby an area 48 ft wide and 60 ft long is mined with each conveyor system. This is a thought-provoking example, in that it would be possible for the one man operating the continuous miner and tandem unit to mine approximately 650 tons uninterrupted and unassisted.

Fixed-Head Machines—Fig. 13 illustrates a plan under which the tandem system will permit a fixed-head fixed-tail machine to work in a system similar to that in Fig. 4. Since fixed-head machines generally mine at a higher rate than the ripper type, use of the tandem bridge unit will permit mining rates that will make possible this extra capacity.

Direct Attachment—Readers familiar with the use of this equipment in conventional mining, where it is attached directly to the tail of the loading machine, may wonder why attachment to the continuous miner is not suggested. Such an attachment is practical and has been made. We feel, however, that the mobile self-loading conveyor is justified on the basis of economics. Extra reach, articulation, surge capacity, mechanical cleanup, and so on, are advantages which we feel will result in sufficiently greater tonnages to quickly amortize the investment.

WHAT'S AHEAD

The preceding material in this article summarizes a great deal of study. The outstanding result was the realization that the "moving problem" had been thoroughly overrated. We have described, step by step, how delays and separate moving costs may be, literally, eliminated in mining individual rooms.

It is significant that in solving this moving problem we do not suggest violating good, proven conveyor practice, and we are dealing with proven types of conveyors with low first cost and low maintenance. There is nothing experimental about any of the equipment suggested. It has shown its ability to perform under the moresevere conditions of conventional mobile loading.

Progress in continuous-mining machine design is certain to be in the direction of higher production rates. The ability of the equipment sug gested here to deal with production rates as high as 5 tpm has been amply demonstrated in conventional mining—in no more space than is now required for 1 tpm.

New Daylight Mine . . .

Teams belt section haulage and loop-track main haulage with modern methods for effective mining.

By A. E. FLOWERS
Associate Editor, COAL AGE

FEATURING concentrated working areas, belt haulage in room panels and loop haulage between the section and slope bottom, the New Daylight mine of the Dawson Daylight Coal Co. is currently producing 2,000 tpd of clean coal from the Kentucky No. 6 seam. Located about 1 minortheast of Dawson Springs, Ky., the new slope operation was developed to replace production from the old Daylight No. 6 mine, which was nearing exhaustion and could not supply enough coal to meet the demand.

The new mine site, selected because of terrain favorable for construction of mine buildings, preparation plant and railroad facilities, is located about 1,400 ft from Kentucky Isighway 109 and 900 ft from the main track of the Illinois Central Railroad.

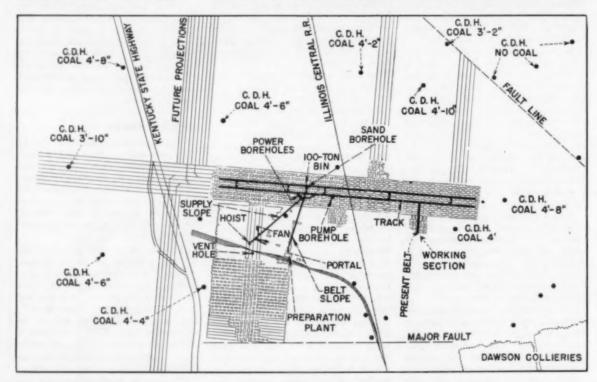
Management of the Dawson Daylight Coal Co. is headed by J. H. Schneider, president. Other officers are W. A. Borries, vice president, operations; V. C. Roerk, vice president; and P. W. Lynch, secretary-treasurer. G. A. Stokes is mining engineer, Virgil Smith is superintendent and Willie Stennett is assistant superintendent. The plant layout of

the mine and preparation plant was designed by Mr. Borries and its installation was supervised by him.

MINING CONDITIONS

The Kentucky No. 6 coal lies 222 ft below the surface at the plant site and cover ranges from a minimum of 148 ft at the northwest corner of the property to a maximum of 320 ft at the southeast corner. Average thickness of the coal is 52 in and although the seam is gently undulating, no sudden changes in thickness are encountered. There are no rock partings in the seam but there sometimes is a thin band of bone on top of the coal.

Overlying the coal is a 50-ft layer



Mining Plan for Recovering Coal Between Faults

LONG-RANGE PLANNING WAS NECESSARY in laying out the New Daylight mine because of three faults cutting the property. Systematic core drilling and information from the Dawson Collieries operations defined the mining limits. The mine was laid out so that a minimum of development

work would be necessary. The result is a combination of loop-track haulage on the main entry and belts in room panels. Panels are necked 300 ft deep as the mains advance. Rooms, on 40-ft centers, are driven in groups of three to a 410-ft depth and pillars are not recovered.

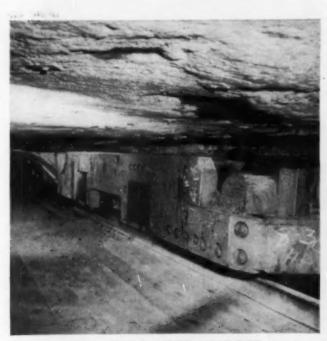


1. SHUTTLE CARS load directly onto a 30-in belt conveyor in panel heading. One belt handles output from three loading units. Belt is driven by 30-hp motor.



2. MINE-CAR LOADING is made parallel to track by reversible chain conveyor mounted at discharge end of belt. Cars are 5-ton 3-door dropbottom type.

Four Steps for Continuous Coal Haulage



 MAIN-ENTRY LOOP HAULAGE between panel belt and slope is handled by 15-ton locomotives pulling 10-car trips. Units have hydraulic and dynamic brakes.



4. MAIN SLOPE BELT carries coal 981 ft from the underground storage bin to the preparation plant. Unit is powered by 125-hp 440-v AC motor.



COAL DRILLING is done with hand-held electric drill. Machine crew helps driller place holes.



FACE LOADING at the New Daylight mine is handled by crawler-mounted unit served by two shuttle cars.



WATER NEUTRALIZER conditions acid water from set- HANDLING SUPPLIES is one of many jobs assigned to tling pond before it is sent to the preparation plant



rubber-tired loading and cleanup unit.



MINE-SERVICE BUILDINGS are of standard steel construction. Building design permits easy disassembly for moving to new sites. A total of 10 such buildings were erected at New Daylight, Preparation plant is in background.



ROOF-BOLTING with 3½-ft expansion-shell bolts, spaced on 4-ft centers, is practiced where weak roof is encountered.



SECTION SUPPLIES are delivered on the third shift by this battery-powered shuttle-car and trailer combination.



KEY MAN is W. A. Borries, vice president in charge of operations.

of shale of variable hardness. In order above this are 3½ ft of lime-stone, 4 to 5 ft of gray shale and 55 ft of sandstone. The remaining cover is a mixture of shales, very thin coal seams and sandstone. Underlying the coal is hard fire clay.

Limits of mining are defined by several faults having displacements up to 115 ft. One of these runs in an east-west direction throughout the property and is located about 1,600 ft south of the slope bottom. A second fault traverses the property in a northeast-southwest direction in the northwestern portion and a third displacement cuts the eastern end of the property in a northwest-southeast direction. A thorough knowledge of these faults was acquired before the mine was developed and mine projections were made accordingly. Infor-

mation was gained from the Dawson Collieries operations that mined to the faults from other directions and from systematic core drilling of the remaining area. As a result, a long-range plan was set up for mining the complete property well in advance of slope development.

Excavation for the 7x9-ft haulage slope began on June 23, 1951, and 2 wk later bedrock was reached. Rock work proceeded on an 18-deg slope and the coal was intersected on Dec. 28, 1951, at a distance of 718.9 ft from the surface. The slope was then extended 130 ft below the coal to a predetermined point directly under the proposed underground storage bin. Armco tunnel liner was installed from the surface to the bed rock.

A second 7x12-ft combination ventilation and supply slope was driven on 22 deg and 30 min and intersected the coal at 577.5 ft. This slope was lined throughout its entire length with Armco tunnel liner bolted to a concrete base.

After both slopes were driven to the coal, development was started by handloading methods. When the development reached the area over the slope bottom, work was started on the 100-ton underground storage bin. A large hole was excavated downward from the coal seam to intersect the slope, and was expanded to full capacity. At the same time development of the bin was in progress, advancement of nine headings, each 14 ft wide on 50-ft centers, was continuing by handloading. The No. 6 heading was projected to pass over the middle of the underground storage bin.

As soon as sufficient territory was opened, two off-track mobile loading

units were put to work driving entries. By this time, installation of the slope belt, a Joy MTB30 unit, was complete so that coal could be delivered directly to the cleaning plant. A third loading unit was added shortly after the first two began production.

MAIN-ENTRY DEVELOPMENT

When development of the nine main west headings had progressed sufficiently, a Goodman 97C 30-in belt conveyor, powered by a 30-hp 275-v DC motor, was installed in the No. 5 heading. A short transfer belt was installed to carry the coal to the storage bin below the No. 6 heading. Installation of the belt in the No. 5 heading permitted laying track in No. 4 and No. 6 headings as the main entry was being developed, and held shuttle-car haulage distances to reasonable values. Development of the nine headings was handled by two off-track mobile loading units, each consisting of a Joy 14-BU loader, Goodman 512 cutting machine with bugduster, Jeffrey A7 or Chicago Pneumatic 572 handheld coal drills, a Chicago Pneumatic RBD30 bolting unit and two Joy 6-SC buggies.

After the headings were advanced 1,200 ft to the west, track was laid in the No. 4 and No. 6 headings, the belt was removed and reset at a point 650 ft west of the storage bin where the first south room-panel was turned.

Track in the main entry is connected at 600- to 800-ft intervals to provide continuous loop haulage from the belt to the bin. Track gage is 42-in and is laid with 60-lb rail on 4x6-inx6-ft treated wood ties spaced on 24-in centers.

Two 15-ton Goodman 165A loco-

motives handle 10-car trips of 5-ton 3-door Sanford-Day dropbottom cars between the underground bin and the belt discharge point.

ROOM-PANEL MINING

Room panels, advanced 300 ft deep as the main entry is developed, are driven 90 deg with the main entry in a 5-heading system. Panels are normally driven 1,600 ft deep. Headings 2, 3 and 4 are driven on 50-ft centers and the outside headings on 40-ft centers. A 100-ft barrier of solid coal is left between the first room and the first heading of the main entry. Rooms, on 40-ft centers, are driven 25 ft wide to a depth of 410 ft and pillars are not recovered.

One mobile loading unit advances the five headings and, when development has progressed sufficiently, two additional units are put to work mining rooms. Each room unit works a group of three rooms on the same side of the belt. When the panel headings have been extended to their projected 1,600-ft limit, the development unit moves to a set of three rooms adjacent to the other two room units. Room mining proceeds in this manner until one side of the panel has been mined, after which the units move to the opposite side of the entry and mine the remainder of the coal on retreat. Room and entry pillars are not recovered.

Coal is bottomeut by Goodman 512 shortwall machines equipped with bugdusters and using Bowdil 7½-ft cutterbars and throwaway bits. These machines have special gears that permit a cutting speed of 40 in per minute. Each machine cuts 18 to 22 places per shift in narrow work and an average of 15 in room work. No difficulty has been encountered in keeping ample coal prepared for the

loading machines.

Three blastholes are drilled in narrow development work and four in rooms. Holes are charged with King Red Crown D2 powder primed with duPont blasting caps. Holes are fired

singly.

After a room panel has been completed, it is sealed with concrete-block walls and drain valves are placed in the walls to permit any future accumulation of water to be released from the abandoned area. A careful study is made of relative elevations in the panel and a 2-in borehole is drilled from the surface to the highest area to bleed off any methane.

ROOF CONTROL

Roof control presents no major problem at the New Daylight mine. Most of the roof is strong enough to permit roof-bolting, and in some areas in room panels single posts set along each side of the shuttle-car roadway are sufficient to support the roof. In some areas where the roof is too friable to permit good bolt anchorage, it must be supported by wood crossbars. To provide permanent roof support, the entire main entry was roof-bolted as it was developed, regardless of the good conditions in many areas.

When bolting is necessary at the face, it is done by a two-man crew who use a Chicago Pneumatic RBD30 roof drill and bolt setter to install 3-ft Bethlehem expansion-shell bolts on 4-ft centers. Bearing plates are 6x6x% in. A 4x6-inx14-ft wood cross-bar set on screw-type roof jacks protects the bolting crew while they

TRANSPORTATION

Shuttle cars deliver coal from the loading machine to a 30-in belt conveyor installed in the No. 3 heading of the panel entry. From here, the belt carries it to the main entry where it is delivered via a Goodman Yo-Yo to 5-ton dropbottom mine cars. As pointed out previously, there is uninterrupted loading of mine cars a a result of the loop-haulage system. Two 15-ton locomotives handle 10-car trips between the loading point and the 100-ton underground bin.

From the bottom of the bin, coal is fed by a Jeffrey reciprocating feeder to the main slope belt for delivery to the preparation plant.

SUPPLYING THE MINE

Mine supplies are loaded into supply cars on the day shift by a three-man crew and lowered to the supply-slope bottom for distribution on the third shift. A Goodman battery-powered 174B shuttle car, equipped with Gould National batteries, and a Baker trailer are used to transfer supplies from the main haulage to the working faces in the room panels. Batteries are charged during the day shift at an underground charging station near the working area.

Coming Next Month . . .

If you're interested in coal preparation methods and results, make it a point to watch for Coal Age's "Preparation Guidebook" in the March issue . . . a permanent reference section on the latest methods of effective, low-cost coal cleaning, plus a convenient buyers' guide listing manufacturers of preparation equipment and materials.

SPARE EQUIPMENT

A complete spare loading unit, consisting of a loading machine, two shuttle cars, shortwall cutting machine and crawler-mounted truck, is kept underground for use in event of a major failure of any face equipment during the work shift. Management feels that the spare unit is good insurance against costly production delays.

Equipment is repaired underground as much as possible, but it is brought to the surface when major repairs are

VENTILATION

Air for the mine is supplied by a LaDel I-54-28 fan delivering 70,000 cfm at a ½-in water gage. A 30-hp 220-v AC motor drives the unit. Air is forced into the mine through a vertical shaft leading to the supply slope which serves as the main intake. Ventilation is simple since all equipment is usually concentrated in one panel and all abandoned panels are sealed and vented to the surface.

PORTABLE SERVICE BUILDINGS

Considerable savings in cost of construction have been achieved by adoption of Armco standard steel mine-service buildings in place of masonry or frame construction. A total of 10 of these buildings were erected at the New Daylight mine. These applications are as follows:

Shop, 28x60 ft

Supply houses (2), 24x40 ft

Oil house, 16x24 ft

Rock-dust and mine-supply house, 24x40 ft

Substation, 16x28 ft

Preparation-plant oil-spray house, 20 ft x 46 ft 8 in

Preparation - plant pump house, 10x12 ft

Sandhouse, 16x24 ft

Additional savings will be realized in the future if any of these buildings have served their usefulness in their present locations and are dismantled and erected elsewhere.

PREPARATION

Preparation facilities, previously described in Coal Age (April, 1953, p 98), consist of hand-picking, crushing, jig washing, dewatering and sizing. An outstanding feature of the preparation plant is application of heated screens to recover coal formerly wasted, improve screen performance, reduce the number of screen changes and increase screen life. Stoker sizes only are loaded at this mine and at the Dawson Collieries mine.

How to Parallel Conversion Equipment

Successful paralleling of motor-generator sets, synchronous converters and mercury-arc rectifiers with each other or with other types of conversion equipment is a matter of proper circuits and proper machine adjustment.

By L. W. SCOTT Engineer, General Electric Co., Charleston, W. Va.

PARALLEL OPERATION of machines converting AC to DC is advantageous where the following conditions exist:

- The load may have increased until it exceeds the capacity of the present machine.
- The load may be so low during light-load periods that it is more economical to run one small machine during such periods because of its lower losses.
 - 3. It often is desirable, in the mining industry, to

standardize on one size of machine. Therefore, in some particular location, if load conditions exceed this rating, another machine is placed in the same station.

Parallel operation consists of the operation of two or more machines from a common AC source, with all machines feeding into a common DC bus.

The American Standards Association defines successful parallel operation as being attained if the load on any generator does not differ more than 15% plus or minus of its rated kilowatt capacity from its proportionate share of the combined load, based on generator ratings, for any change of the combined load between 20% and 100% of the sum of the rated loads of all the generators.

Paralleling Motor-Generator Sets

To secure stable operation of DC generators, it is absolutely necessary that each generator to be operated in parallel have a drooping-voltage characteristic. In other words, as the load increases from no load to full the voltage at the terminals of the generator must decrease. With compound-wound generators, this condition must be obtained when the series field is disconnected. Naturally, with the series field in the circuit, these machines may have a rising characteristic.

Shunt-Wound Generators

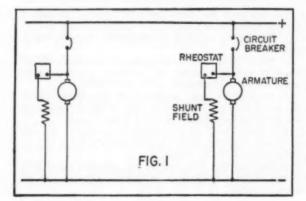
Shunt-wound generators are usually stable in parallel. Their voltages drop off under load as a result of internal resistance drop and the demagnetizing effect of armature reaction. Under ordinary conditions they will operate successfully in parallel, the division of the load being controlled by the shunt-field rheostat. For exact division under variable conditions, the drop in voltage in each

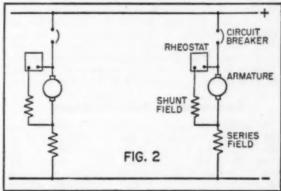
machine, as the load is increased, should be the same for any given percentage of load. If not, it may be necessary to insert a series resistance in the machine with the lesser droop.

Fig. 1 shows the connection for shunt-wound generators.

Compound-Wound Generators

If two over-compounded generators were connected as shown in Fig. 2, they would operate in parallel successfully as long as there was absolutely no change in the total load or in the relative speed of the driving units. Any increase in the load or speed of one machine would cause it to take more than its share of the load, and as soon as this happened the additional current in the series field of this machine would tend to raise its voltage. This in turn would cause it to take still more of the load, tending to raise its voltage still higher. Meanwhile, the other machine, taking less load and consequently less current



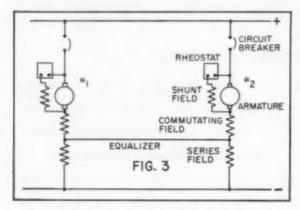


through its series field, would keep dropping load and eventually would operate as a motor. This cumulative action would continue until the excess current in the loaded machine would trip its circuit breaker.

To overcome this tendency and secure stable operation in parallel, it is the practice to install an equalizer bus where two compound-wound generators are to be operated in parallel. The proper connections for such an equalizer are shown in Fig. 3. Note that the connection provided by the equalizer is equivalent to placing the two machines in parallel ahead of the series fields at a point where they are operating as shunt generators with drooping characteristics, thus meeting the first essential requirement for parallel operation.

Compound-Wound Generators With Commutating Fields

Fig. 3 shows the proper connections for parallel operation of two compound-wound generators with commutating fields. If Machine No. 1 tends to take more than its correct share of the load, part of the current from this machine will pass through the equalizer and through the series field of Machine No. 2, thus increasing its series field strength and causing it to take more load until proper balance is restored.



ASA standards state that the resistance of the equalizer connection shall not exceed 20% of the resistance of the series-field circuit of the smaller machine.

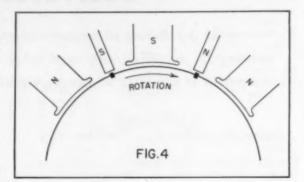
It also is a necessary requirement in paralleling compound-wound generators that the compounding be the same. That is, if one machine compounds from 250 v at no load to 275 v at full load, the other machine must have exactly the same rise in voltage.

It also is necessary that the resistances of the seriesfield circuits from the point where the equalizer is connected through the series field to the negative bus be inversely proportional to the kilowatt ratings of the machines. That is, for machines of like ratings, the resistances of these circuits should be equal, and if one machine is twice as large as the other, the resistance of the seriesfield circuit should be one-half that of the smaller machine.

Commutating-Pole Machines

The addition of commutating poles to a machine, besides improving commutation, also materially changes its characteristics. As a result of the neutralization of the demagnetizing armature reaction by the commutating poles, the voltage of shunt-wound generators with poles does not droop as rapidly as that of a machine without

poles. Because of this smaller droop, a commutating-pole generator, if paralleled with a unit without poles, would tend to take more than its share of the load and probably would require a series resistance to make it share the load proportionately. This also is true of generators with compensating windings.



Referring to Fig. 4, if the brushes are set on neutral—that is, on the commutator bars connected to the coils directly under the middle of the commutating poles—the total flux being cut by the armature is unchanged by the commutating poles. One half of the flux of any south pole is counterbalanced by one-half of the flux of the next north commutating pole, leaving the flux between the brushes as that of the main field alone.

Shifting the brushes ahead of neutral—that is, in the direction of rotation—causes the commutating flux to subtract from the main flux, since the effect of the north commutating pole is increased while that of the south pole is decreased, producing a drooping characteristic in a shunt machine and reducing the compounding in a compound-wound machine.

Shifting the brushes back to neutral—that is, against the direction of rotation—causes the commutating flux to add to the main flux since the effect of the north commutating pole is decreased while that of the south pole is increased, reducing the droop or even resulting in a rising characteristic in shunt-wound machines and increasing the compounding in compound-wound machines.

Since, as already pointed out, it is impossible to secure satisfactory parallel operation with a rising-voltage characteristic as a shunt generator, care must be taken to see that the brushes are never shifted far enough back of neutral to produce this condition.

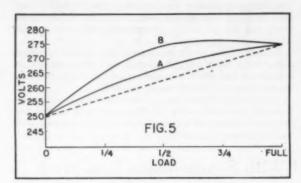
Paralleling Procedure With Compound-Wound Generators

The five steps that should be taken to secure successful parallel operation of compound-wound generators are:

- See that an equalizer of sufficiently low resistance is installed.
- Set the brushes on neutral and, if commutation is not black at full load, make the necessary adjustments in commutating-field strength.
- See that the speed regulation of the driving units is the same from no load to full load. If the driving units are synchronous motors, this check is unnecessary.
- 4. Check to see that the compounding—that is, the rise in voltage from no load to full load—is the same. If not, adjust series fields by shunts.
- See that the resistance of the complete series field circuit of each machine is in inverse proportion to its kilowatt rating.

Paralleling With Intermediate Loads

Even if all the conditions set out in the previous material are correct, compound-wound machines, while dividing exactly at full load and with no tendency of either machine to motor at no load, may not divide proportionately at intermediate points on the load curve. This results from the fact that all compounding curves have a hump and this hump may be higher in one machine than in another.



Curve A of Fig. 5 represents the compounding curve of one machine, and Curve B, another. If the shunt-field rheostats are adjusted for equal division with full load on each machine, then Machine B will take somewhat more than its proportionate share at intermediate load values. This difference usually is within the limits set by ASA standards for successful parallel operation.

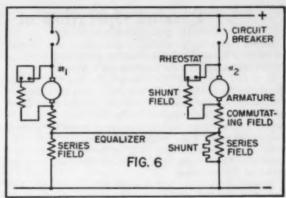
Most commutating-pole machines have sufficient commutation margin to permit the brushes to be moved a certain distance off neutral while still maintaining black commutation. Sometimes it is possible to shift as much as a bar or a bar and a half and still maintain black commutation.

Advantage may be taken of this fact to obtain small adjustments of load division for parallel operation without adding resistance to the series field circuit. To avoid the possibility of a rising-voltage characteristic, it is best, as previously explained, to shift the brushes forward in the direction of rotation on the machine that takes more than its share of the load, on increasing total load, rather than backward on the other machine. This, of course, reduces compounding slightly, and if it is essential that exact compounding be maintained, then one machine may be shifted forward and the other backward as long as the backward shift still leaves the machine with a drooping voltage characteristic, as a shunt machine.

While shunting of the series field to obtain correct compounding is proper as outlined in Step 4 of paralleling procedure, this shunting should be done only for this purpose. Furthermore, it should always be followed by Step 5 so that the change in the total resistance of the series field circuit may be checked and, if necessary, corrected by inserting series resistance in the proper place.

Shunting the Series Field

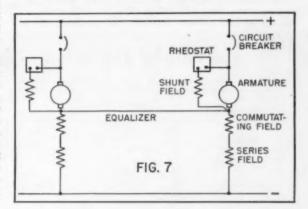
A very common mistake in attempting to parallel compound generators is trying to secure proper division of the load by shunting the series field of the machine taking more than its proportionate share of the load. In Fig. 6, if Generator 2 is taking more than its share, a shunt is placed around the series field of this generator with the idea that it will by-pass part of the current from the series field and reduce the load taken by this machine.



Use of this shunt, however, reduces the total resistance of the series field circuit of this machine so that current flows through the equalizer from the armature of the other machine, reducing the strength of the series field of Machine No. 1 and resulting in very little, if any reduction of the strength of the series field of Machine No. 2. The net result is that the load division between machines is left substantially the same, though it may be worse.

Commutating Field in Equalizer Circuit

Another mistake quite frequently made is attempting to compensate for the compounding effect of the commutating field, caused by the brushes being set off neutral, by placing the commutating field within the equalizer circuit. Fig. 7 shows such a connection.



While such a connection will result in stable parallel operation even when the compounding effect of the commutating fields is present, it has one serious drawback. Unless a means of opening the equalizer circuit when the main breaker of either machine opens is provided, this is the situation: When one breaker opens as a result of overload or short circuit, and until the breaker on the other machine opens, a large part of the current from the commutating and series field of the machine still connected to the load is shunted out by the equalizer through the commutating and series field of the other machine.

Since it is almost impossible to obtain simultaneous operation of two breakers in parallel, this sudden change in commutating-field strength during overload or short circuit will very likely result in the machine flashing over. The correct remedy is to set the brushes on neutral and, if necessary, readjust the commutating field.

Parallel Operation of Synchronous Generators

Before discussing paralleling of converters, note should be taken of some of the fundamental differences between the DC generator and the synchronous converter.

In a DC generator, the voltage is a function of the speed and the field strength. Any change in either changes the voltage. In the converter, the DC voltage has a fixed ratio to the voltage applied to the AC rings. This ratio depends upon design and the number of converter phases, and shows much less change from no load to full, compared to the corresponding drop in the shunt-wound DC generator. This results from the much-lower armature reaction of the converter.

Remember that the field strength of the converter does not affect the DC voltage directly. However, considered from the AC end, the converter is operated as a synchronous motor. Therefore, an increase in field strength results in a change of power factor.

Compound-wound generators are usually flat compounded. As the load increases on the converter, the increase in series field strength causes the machine to draw less lagging current from the line through the high-reactance transformers supplied with the converter so that there is less drop in the transformers. Consequently the voltage rises at the AC rings, thus, since the ratio of the converter is fixed, compensating for the drop in the converter armature and resulting in a constant DC voltage. The foregoing assumes that the AC voltage remains constant from no load to full load. If the AC voltage falls there will be, of course, a proportionate drop in the DC voltage.

Because of the lower armature drops and the fact that converters usually are flat compounded, they are not so sensitive as DC generators when operated in parallel, and stable operation is more easily secured.

The method of paralleling compound-wound converters is exactly the same as for DC generators, and all that has been said about motor-generator sets applies equally well to synchronous converters.

Paralleling Motor-Generator Set With Synchronous Converter

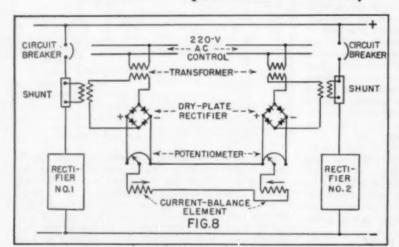
Successful parallel operation of motor-generators and synchronous converters cannot be obtained unless a regulator is used with the DC generator. Since the DC generator is being driven by a synchronous motor at a constant speed, a variation in AC voltage, unless large enough to cause the motor to pull out of step, will not result in corresponding variation in DC voltage.

The DC voltage of the converter, on the other hand, varies directly with every variation in AC voltage, and consequently every AC voltage change would result in a change in load division between the machines. By in-

stalling a regulator on the DC generator and using the same circuit as described for paralleling motor-generators and rectifiers, successful operation can be obtained.

However, if variations in the AC voltage are not too great, satisfactory paralleling of converters and motor-generators can be obtained without the use of a regulator, provided the machines have at least 0.025 ohms between them. This is equal to a distance of 2,000 ft with a No. 9 section trolley wire in parallel with a 1,000,000-cir mil feeder and a 60-lb rail which is return bonded and cross bonded.

Parallel Operation of Mercury-Arc Rectifiers



In the mercury-arc rectifier, the DC voltage, like that of the converter, is in direct ratio to the AC voltage. Also, the rectifier has an inherent regulation of about 7%. That is, in an unregulated rectifier, the DC voltage would drop 7% from no load to full load if the AC voltage remained con-

stant. It is customary to provide regulators with rectifiers which, by phase shifting of the firing circuit, result in flat DC voltage from no load to full load. A voltage regulation of 15% is customarily supplied, which leaves 8% in addition to the normal 7% to take care of AC voltage variations. Fig. 8 shows the method used to obtain equal division of load between two rectifiers operating in parallel. The additional equipment required consists of two small transformers, two small saturable reactors each with one AC and one DC winding, two small dry-plate rectifiers, and two small potentiometers. This equipment is used to provide a small signal current in the two current-balance windings in the regulator of each rectifier.

The primaries of the two small transformers are connected to the 220-v AC control circuit of the rectifiers (Fig. 8). The secondaries are connected in series with the AC windings of the respective saturable reactors to the dry-plate rectifiers. The DC windings of these reactors are connected to the respective shunts carrying the main load current of the main rectifier. The DC terminals of the dry-plate rectifier are connected to the stationary terminals of the potentiometers, and the movable terminal of one potentiometer is connected in series with the currentbalance elements of both main rectifiers to the movable terminal of the other potentiometer.

Now, if equal currents are flowing in the main shunts of each rectifier, the impedance of the two saturable rectifiers is the same, and therefore the AC voltage imposed on each of the dry-plate rectifiers is the same. Thus, the DC voltage on each dry-plate rectifier is equal and, if the movable arms are set in the same position, the potential of the movable-arm terminals is the same and no current flows through the current-balance elements.

Should the load on Main Rectifier No. 1 become higher than on No. 2, the increase in the current in the DC winding of its saturable reactor reduces the impedance of this reactor, raising the voltage applied to the dry-plate rectifier. This raises the left-hand stationary terminal of the potentiometer to a higher positive potential than the corresponding terminal on the second rectifier, and therefore raises the movable terminal of the potentiometer on Machine No. 1 to a higher positive potential than that of the corresponding movable terminal of the potentiometer of Rectifier No. 2. This results in a flow of current through the two current-balance elements in direction of arrows.

These current-balance elements are so connected that current flow in this direction causes the regulator on Rectifier No. 1 to reduce the voltage of its reactifier and that on No. 2 rectifier to raise its voltage, thus reducing the load on No. 1 unit, increasing it on No. 2 and restoring the balance.

Adjustment of the movable arms on the potentiometers permits compensation for differences in the characteristics of the two main rectifiers and their regulating circuits.

Paralleling Motor-Generator Set With Mercury-Arc Rectifier

Since mercury-arc rectifiers are furnished with regulators to hold constant voltage over the load range, it is first necessary to adjust the motor-generator set for flat compounding to obtain successful parallel operation. If the generator is over-compounded, the series field should be shunted so that the same voltage will be attained at no load and full load.

To secure correct division of the load, the same circuit is used as in paralleling two rectifiers (Fig. 8), except that the current-balance element is omitted from the generator circuit since the generator is not equipped with a regulator. All adjustments for proper load division therefore are made by the rectifier regulator, by adjusting the rectifier voltage, thus making the rectifier a "slave" machine.

Paralleling Synchronous Converter With Mercury-Arc Rectifier

Since synchronous converters for mining service are flat compounded, no adjustment of the series-field circuit is required for parallel operation with rectifiers. The same circuit is used as in paralleling motor-generators and rectifiers.

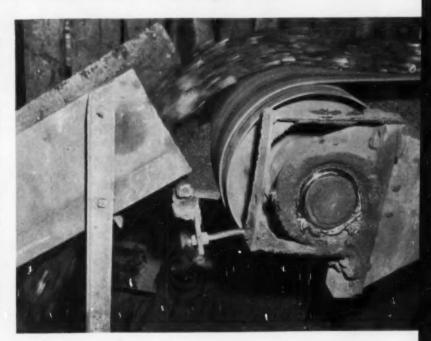
Adapted from a paper presented at the 1953 AIEE Middle Eastern District meeting, Charleston, W. Va.

Moving Belt Cleaner Saves Cleanup Labor

CHANGING THE POSITION of belt cleaners from the underrun behind the drive pulley to the front center of the drive pulley is saving a man-shift of cleanup labor in the Mikegrady mine of the Russell Fork Coal Co., Inc., Praise, Pike County, Ky. The new position, devised by Homer Stone, belt mechanic and welder, is shown in the accompanying photo taken at the tipple discharge of the last, or outby, section of the underground belt.

Each of the four underground belt transfers in the mine also have been equipped with cleaners mounted in this head-pulley position, an arrangement that obviously drops the scraped-off material directly onto the top run of the outby belt. Previously, with the belt cleaners on the underrun, material was dropped on the mine bottom and had to be shoveled up unless the conveyors were lapped for several feet. Other advantages of the pulley mounting are that the distance from the cleaner-blade mounting to the belt surface remains constant and that the cleaner is readily accessible for adjustment or renewal.

The cleaner blade is a piece of rubber without fabric core, measuring 1x6x32 in. At this mine, weekly adjustments of the %-in full-threaded bolts compensate for the blade wear of about ¼ in a month.



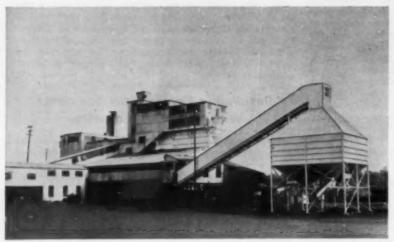
More "Mine-Tested Operating Ideas" Appear on Pages 116, 118 and 120

Making Money With Waste

PROBLEM: Recovering minus 28M coal from sludge formerly wasted.

SOLUTION: Addition of tables, cyclones and filter to present preparation facilities.

RESULTS: Profitable recovery of 300 tpd of clean minus 28M coal.



PREPARATION FACILITIES at Bell & Zoller's Buckhorn mine include jig washing, crushing dewatering and drying. Flexibility permits simultaneous loading of five sizes in railroad cars and serving truck customers from storage bins.

40-FT-DIAM SETTLING SLUICE ISTRIBUTOR 12-FT-DIAM SLURRY CONE TABLES 20" CYCLONE CYCLONES CLEAN COA 40-HP 15-HP 4" SETTLING 25-HP PUMP BASIN TO DEWATERING FEED WELL SCREENS OR VACUUM FILTER TABLE-REFUSE TROUGHS FILTRATE FILTER CAKE DRAG CONVEYOR TO RR

FLOW SHEET for recovering minus 28M coal from sludge. Numbers in circles refer to illustrations on opposite page.

PROFITABLE RECOVERY of 300 tpd of clean 28x200M coal from slurry formerly discarded in a silt pond marks another forward step in preparation at the Buckhorn mine of the Bell & Zoller Coal Co., Johnston City, Ill. Major equipment upgrading a raw product containing 25% ash to one with 10.5% ash consists of four wet tables, three cyclones, a vacuum filter and slurry pumps.

Construction of new power plants within the market range of the Buckhorn mine presented an opportunity for sale of coal containing 28x200M material. As a result, Bell & Zoller management became interested in recovery of coal from the minus 28M material being wasted in a settling pond.

A series of engineering tests were conducted by company engineers in cooperation with manufacturers' technical men to determine whether it was economically possible to recover the fine coal. A series of samples of slurry was taken at the discharge point in the slurry pond and tested for size consist, proximate analysis, washability and adaptability to wet-table washing. Results of the tests were favorable and, as a result, management decided to install facilities for cleaning the minus 28M slurry.

Major equipment selected for the job consisted of the following:

- 4 Deister Concentrator SuperDuty tables.
- 1 Concenco feed distributor.
- McNally-Pittsburg settling tank with drag conveyor.
 - 1 12-ft Deister slurry cone.
- 3 Peterson cyclones (one 20-in, two 14-in).
 - 1 6x10-ft Peterson filter.

Pumps to handle raw coal, clean coal, refuse and water.

HOW THE SYSTEM WORKS

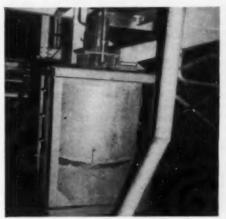
Slurry passing through a ¼-mm Wedge Wire screen on the clean-coal classifying screen is delivered to a slurry sump where two 10x10 McNally-Pittsburg centrifugal pumps pick it up and deliver it to a 40-ft settling cone near the top of the preparation plant. Beneath this cone, on



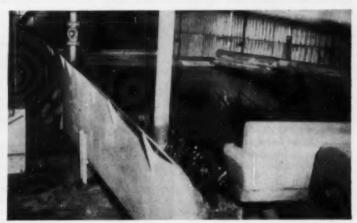
SLURRY CONE receives concentrated silt from 40-ft settling tank as the first step in the recovery process. Centrifugal pump delivers slurry to concentrating tank.



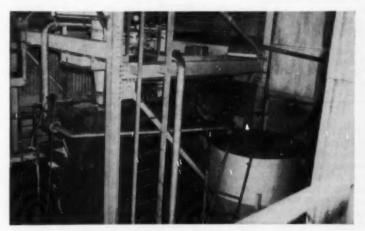
2 SLURRY-CONCENTRATING TANK with inclined bottom and drag conveyor concentrates solids and discharges them into a sluice for delivery to distributor.



3 FOUR-WAY DISTRIBUTOR driven by %-hp motor receives concentrated slurry via sluice and feeds it evenly to four wet tables.



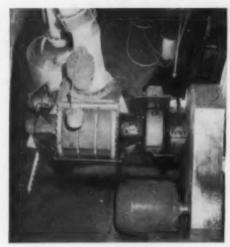
4 BATTERY OF FOUR TABLES handles cleaning of minus 28M coal and refuse. Raw feed containing 25% ash is upgraded to 10.5% ash. Refuse passes to a sump and is pumped to settling pond.



5 CONE OVERFLOW passes to steel tank (right) and is pumped to sprays on dewatering screens and to table refuse troughs. Three cyclones and filter are in background.



6 FINAL DEWATERING of clean coal is by a vacuum filter receiving concentrated product from three cyclones.



ROTARY POSITIVE BLOWER, powered by 125-hp motor, produces vacuum on filter.



RECOVERING 300 tpd of clean coal from minus 28M material formerly wasted in this area is now achieved with cyclones and a vacuum filter.

O	per	ati	ng	Data

Proximate Analysis (M. F.) Raw Feed to Tank

Vol. Matt	er				0		0		0	.31	.97%
Fixed Car	bon									.42	.30%
Ash, Mois	t. Free	١.,							٠	. 25	.73%
Btu, Mois	t. Free	è.,						0		. 1	0,639

Wgt % Ash, M. F;

Raw Feed to Tank

Plus 28M				,				27.8
28 x 35M.								10.4
35 x 48M.								13.6
48 x 80M.								7.9
80 x 100M.								9.2
100 x 150M.								7.0
150 x 200M.								5.3
Minus 200M		۰	0	0	0	0		18.8
	21	ia				1	r-	den *

Size

	F	It	e	r	1	Cake	*	
Plus 28M						. 45	.8	10.85
28 x 35M.						. 14	.7	11.90
$35 \times 48M$.						. 15	.0	12.50
48 x 80M.						. 7	.0	14.85
80 x 100M						. 6	.6	11.80
100 x 150M						. 4	.1	21.95
150 x 200M						. 2	.3	27.70
Minus 200M							.5	41.80
"Head sam	ple	,	8	ne	oús	sture	25.13	5%: ask
10.48%	0: 4	As	h	0	M	(, F.)	13,68	

Filter Effluent

Solids in effluent, 0.231	lb/gal	
Plus 28M	2.3	24.50
28 x 35M	4.6	27.00
35 x 48M	14.2	24.60
48 x 80M	2.3	22.80
80 x 100M	13.4	27.00
100 x 150M	10.2	33.00
150 x 200M	8.8	38.80
Minus 200M	44 2	50.00

Feed-Tank Effluent

Solids in effluent, 4.05 tph	0.675	lb/gal,	200 gpm,
Plus 28M		0.5	
28 x 35M		2.2	30.40

28 x 35M	2.2	30.40
35 x 48M	4.1	34.30
48 x 80M	7.7	22.30
80 x 100M	5.9	21.05
100 x 150M	12.5	16.60
150 x 200M	31.7	24.85
Minus 20034	35 A	35 40

Cyclone Effluent

Solids in effluent, 0.443 lb/gal	
Plus 28M 9.5	14.90
28 x 35M 7.4	15.25
35 x 48M 12.3	15.55
48 x 80M 14.3	15.80
80 x 100M 9.7	15.05
100 x 150M 16.9	16.80
150 x 200M 14.3	18.15
Minus 200M 15.6	32.50

the ground floor of the plant and receiving concentrated slurry from it, is a 12-ft diameter Deister slurry cone. Leading tangentially from the bottom is a short length of 6-in pipe connected to a 4x6 McNally-Pittsburg centrifugal pump, powered by a 15hp 440-v AC Westinghouse motor, delivering slurry to a McNally-Pittsburg slurry-concentrating tank. A drag conveyor powered by a 5-hp 440-v motor moves solids up the

inclined bottom of the tank to a sluice. Water overflow from the tank containing some fine solids passes to waste. Clear water is added to the solids in the sluice and the material is washed to a four-way Concenco distributor, powered by a %-hp General Electric motor, feeding four Deister Concentrator SuperDuty tables.

Clean coal from the tables passes to a sump from which a 5-in Hazle-ton Type "VS" slush pump powered

by a 40-hp motor delivers it via a 5-in pipe line to a 20-in Peterson cyclone where it is concentrated. Overflow from this cyclone passes to two 14-in Peterson cyclones for secondary concentration. Underflow from all three cyclones passes to a feed well directly over a 6x10-ft Peterson filter. A Roots-Connersville rotary postive blower, powered by a 125-hp Westinghouse induction motor, produces the vacuum on the filter. Filter cake passes to a drag conveyor and clean 2x0 from the jig washer is added to make the final 2x0 for the utility market.

Overflow from the two 14-in cones passes to a 2,000-gal tank from which it is pumped to sprays on the dewatering screen and to the table refuse troughs where it helps wash table reject to a refuse sump. Table refuse is pumped to a settling basin through a 4-in line by a 4-in Hazleton type "VS" slush pump.

Buckhorn mine currently is producing 4,500 tpd from the Illinois No. 6 seam with off-track loading machines and continuous miners served by shuttle cars. Coal enters the wetwashing plant via a 36-in belt extending down the mine slope to an underground storage bin receiving coal from mine cars. Raw coal from the slope belt is transferred to a magnetic-separator belt equipped with a Dings magnetic pulley that removes tramp iron. It then passes to a 10x20-ft McNally rotary breaker where it is reduced to minus 8-in.

The breaker product is delivered to a McNally-Norton 5-cell jig where it is separated into refuse, middlings and clean coal. Refuse is trapped off in the first two cells and middlings in

the other three. Middlings are broken to minus 1½-in and delivered to a McNally-Norton 3-cell jig for secondary cleaning. Clean coal joins the clean product from the primary jig and refuse passes directly to the refuse bin.

All clean coal is sluiced onto the main classifying screen where it is dewatered and separated into five sizes. The bottom deck of the screen is equipped with a ½-mm Wedge Wire screen that removes slurry which is directed to the slurry sump. There,

two McNally-Pittsburg 10x10 centrifugal recirculating pumps pick it up and deliver it to a 40-ft settling cone.

The clean 1x28M product from the main classifying screen is sluiced to three 5x20-ft McNally-Pittsburg shaking dewatering screens, also equipped with ½-mm screens. Underflow from these also passes to the slurry sump.

Overproducts from the dewatering screens are heat-dried in three 75-tph McNally-Vissac heat driers. Effluent from these units also passes to the slurry sump in the basement.

Prior to the installation of the new fine-coal recovery system, all slurry was pumped to the 40-ft slurry tank. Solids settled to the bottom of the tank and enough were tapped off to prevent the cone from filling with solids. A 6x8 McNally-Pittsburg centrifugal pump delivered these solids to a settling basin via a 3-in pipe line and it was considered a waste product. This represented about 330 tpd of clean coal on the basis of the performance of the new equipment.

Utah Mystery: Prehistoric Mining?

DID THE INDIANS MINE COAL in Utah before the white man came?

That question recently was raised when workers at the Wattis mine, Lion Coal Corp., Wattis, Utah, drove into tunnels that appeared to be of great antiquity.

As A. B. Foulger, vice president and general manager of the company, describes the discovery, miners ran into the old drifts as operations advanced down the center of a 3,500-ft-wide peninsula branching off from the mountain where the mine is located. The coal seam being worked is about 8 ft thick and is at an elevation of 8,500 ft.

As work moved down the peninsula, Mr. Foulger reports, miners ran into pockets of coal that had oxidized to the point where it almost could be scooped out of the face with bare hands. They encountered larger and larger pockets of this soft, lifeless coal until, at last, they hit two tunnels about 200 ft apart in the seam.

In May, 1953, when Mr. Foulger inspected the workings, both old tunnels appeared to be between 5 and 6 ft high and about the same in width. Because of moisture and air, the coal between the two tunnels had deteriorated until it was altogether unmerchantable.

Several miners, crawling down these old drifts a short distance, found that the ribs and roof had sloughed badly and that the tunnels were about half full of slack coal. Earlier, some had reported finding rooms mined off from either side of the tunnels.

Search of the outside of the mountain in direct line with the tunnels revealed no trace of any portal, Mr. Foulger says. This fact led to the tentative conclusion that erosion, taking place perhaps over several centuries, had erased all signs of outside entries. In addition, the highly oxidized condition of the coal indicated the passage of many years, during which water and air had bled out the volatile matter.

Being, by his own admission, no anthropologist, Mr. Foulger in August invited representatives of the University of Utah to inspect the discovery. Accordingly, on Aug. 13, Professors John E. Willson, Experiment Station of the Department of Engineering, and Jesse D. Jennings, Department of Antropology, toured the workings. They were accompanied by Mr. Foulger; Grant Foulger, purchasing agent; and Earle McAlpine, mining engineer.

Unfortunately, since Mr. Foulger's last inspection in May, cave-ins had occurred in the old drifts. These blocked the inspection party from several places where miners formerly had entered freely. Evidence as to the origin and date of the old workings therefore is incomplete and the conclusions of the inspecting party are not firm.

Here in brief, however, are the professors' comments:

Professor Willson—One drift was completely caved; the other, all but the inside 10 to 15 ft. Without doubt, both drifts were man-made. Though no evidence was found at the outcrop, the tunnels apparently were driven some 450 ft from the outside to the point where the present workings broke into them. The openings apparently were rectangles, about 2 ft wide by 4½ ft high. The present elliptical shape may have been caused by sloughing.

There is no visible basis for dating the tunnels. It is known that early miners drove such tunnels for prospecting. But if, as some but not all of today's miners report, rooms were driven off the tunnels, prospecting must be ruled out.

As for the absence of any visible outside entrance, the terrain is so rough that erosion by one or two bad storms might completely conceal the opening even within a very few years. Further, the oxidized coal found in the drifts is typical of outcrop coal that has been weathered.

Professor Jennings—We saw only the inner end of the easternmost of the two old drifts. There was no evidence of outer openings along the outcrop where a projection would lead an investigator to expect such evidence.

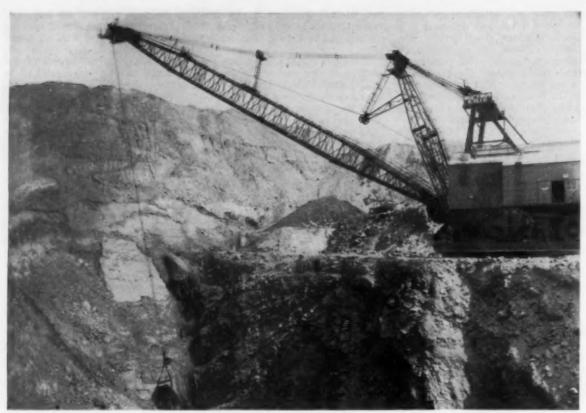
Because the tunnels were too badly caved to permit inspection, I do not feel that I observe enough to shape an opinion as to their origin or the people that drove them.

The fact that all of the coal in this part of the mine is soft, oxidized crop coal rules out the tunnels as the cause of the oxidation and removes the poor quality of the coal as an argument for the antiquity of the tunnels.

The American Indians are known to have mined for various minerals and precious stones. But the only coal mines of which I have knowledge are those worked by the Hopi Indians on northern Arizona from about 1100 to 1600 A. D. Their mining was a primitive stripping, with long-face. Deep tunneling apparently was unknown to them.

I doubt that these tunnels are the work of any American Indian of whom we have any written or archaeological record. In the first place, such works would have required some immediate and local need for coal. It is not reasonable to suppose that extensive tunnels would have been driven to produce coal for export to distant parts of the state because, before the white man came, transport was by human cargo carriers, or porters, and long-distance movement of heavy loads was impracticable. As for local use, there is no reported extensive burning of coal by aboriginals in the region of the Wattis mine.

I think it best to render a Scotch verdict of "Case not



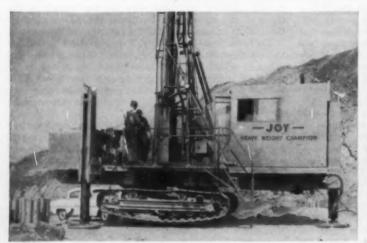
HIGH STRIPPING CAPACITY, concentrated in a few big machines, results in higher output per man.

High-Capacity Stripping

Foresighted maintenance keeps big machines operating with minimum delays.

Higher output, fewer unexpected breakdowns are the benefits in deep stripping.

By HAROLD DAVIS, Associate Editor, COAL AGE

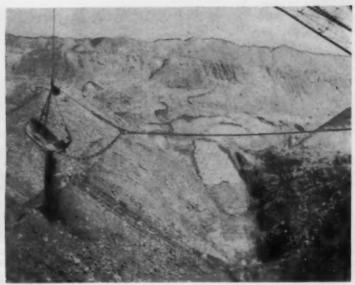




SINGLE ROTARY DRILL, manned by an operator (right) and a helper, provides blastholes up to 150 ft deep in keeping overburden preparation and blasting far enough ahead of dragline to prevent delays and damage from vibration.



THE 22-YD DRAGLINE, serviced for steady operation, is the nucleus at Oakdale.



WORKED-OUT SECTIONS of the pit provide spoil room. Coal is recovered by dragline and stockpiled above dragline bench to speed haulage.

APPLICATION OF THREE of the fundamentals of efficient stripping—high-capacity machines, concentrated operations and a balanced cycle—are contributing to high productivity at Oakdale, Pa., where A. E. Dick Contracting Co., Hazleton, Pa., is stripping anthracite from the 30-ft Mammoth vein under 170 ft of cover for the Jeddo-Highland Coal Co., Jeddo, Pa.

Major unit in the three-unit team is a 22-yd Bucyrus-Erie 1150-B dragline with a 200-ft boom. Loading is done by a Bucyrus-Erie 44-B loading shovel fitted with a 2½-yd bucket. Drilling is done by a Joy 58-BH rotary drill and haulage by 25-ton International LFD-320 trucks.

The trim working force includes three operators, three oilers and three groundmen for triple-shift operation of the dragline, an operator and an oiler for single-shift operation of the loading shovel, operators and helpers for double-shift operation of the drill, and the necessary truck drivers, bulldozer operators, ramp laborers in the pit, operators for the road grader and sprinkler, welders truck mechanics, and general laborers.

STRIPPING OVERBURDEN

In view of the thick cover, which includes from 20 to 30 ft of softer surface material underlain by shale followed by sandstone down to the coal, and the narrowness of the basin, spoil room is at a premium and dragline moves are scheduled to eliminate spoil haulage and recasting wherever possible.

Initial openings are made along the sides of the basin at the outcrops of the seam. From these vantage points the dragline is in a position to cast the spoil out of the pit once and for all. Second phase finds the dragline constructing a bench for itself about 120 ft above the coal. The unit then is in position to excavate both blasted cover and coal from the basin depths. The dragline bench is about 30 ft below the top of the harder strata which require drilling and blasting.

As coal is removed across the basin, spoil from the next cut is returned into the worked-out areas. Only in rare instances is it necessary to haul spoil out of the pit or resort to recasting.

The coal is stockpiled on the drilling bench, about 30 ft. above the dragline bench. The 44-B loads it into trucks at this level. Both the dragline and the shovel operate on overburden which has previously been drilled and shot.

PREPARING OVERBURDEN

The rotary drill works about 200 ft in advance of the stripping unit, as measured along the longitudinal axis of the basin. This interval between preparation and stripping operations provides three advantages, as follows:

 The dragline has enough work ahead of it to keep it operating at full capacity even though delays may be encountered in other phases of the work

2. Blasting of successive rounds is done against the buffer cushion provided by the previously prepared overburden, thus dampening both underground and airborne concussion waves.

3. The dragline and shovel are far enough away from the blasts to eliminate damage from excessive vibrations or rare instances of flying material. They need not be moved, but merely "buttoned up" while the blast is detonated.

The blastholes are drilled 7% in in diameter with Hughes Tri-Cone W7R bits to a depth of 140 to 150 ft. Cuttings are flushed from the hole by compressed air and are collected and deposited near the hole for later use as stemming material.

Overburden blasts are detonated at intervals of about 2 wk, the usual shot including 20 to 21 holes. Stemming fills the top 30 ft of each hole, the cuttings from the rotary drill providing excellent confining characteristics to insure maximum exertion of the explosive forces within the body of the overburden.

For maximum assurance of complete detonation, the charge in each hole is primed with a double run of Primacord, a hedge against the possibility of having a single length of Primacord cut or parted in the hole, thus isolating a portion of the charge.

Electric blasting caps are used to detonate the round, with short delays between rows contributing to better fragmentation at the back of the cut.

SHORTSTOPPING DELAYS

With operations at Oakdale concentrated as they are, and with the success of the project depending upon



25-TON TRUCKS haul coal from stockpile on dragline bench to railroad-car loading ramp a mile away.



SOFTER OVERBURDEN, requiring no blasting, is bulldozed to spoil area to make drilling bench.



ROAD MAINTENANCE, grading and sprinkling, keeps well-built roads in good shape for fast haulage.



GEORGE DIPPEL, stripping foreman, supervises operations and maintenance at A. E. Dick's Oakdale job.

steady operation of a few high-capacity machines, the Dick organization takes positive steps to head off fore-seeable delays.

For example, the company maintains three buckets for the 1150-B, one in use, one at the job as a spare, and one in the shop being rebuilt. The three are rotated from job to shop, thus providing the dragline with effective digging capacity at all times and making it possible to replace a damaged bucket immediately.

In effectively shortstopping another delay at the 1150-B, the company mechanics resocket the drag ropes every third or fourth Sunday. Experience shows that when drag ropes part, the break usually comes near the sockets at the bridle chains of the bucket. The 1150-B is equipped with twin drag cables consisting of 285 ft of 2½-in Bethlehem cable. Stresses

resulting from vibration in the cables are concentrated near the sockets, causing fatigue and ultimate breakage. In resocketing, about 18 in is cut from the bucket end of each cable and the unstressed part of the rope is replaced in the socket.

Another maintenance practice, leading to steadier operation of the 1150-B, is the scheduled replacement of the bottom plates under the tub upon which this walking unit rests while working. As the dragline moves from place to place, the trailing end of the tub scuffs the ground while the leading edge is raised through the action of the pontoons. The 2x5-ftx1-in plates must be replaced to maintain the strength of the tub.

This was last done during the recent miners' vacation by driving tunnels under the tub and replacing the plates which were uncovered in the roof of each tunnel. Moving the unit from place to place permits fresh tunnels to be driven under portions of the tub needing new plates.

The haulage trucks are maintained at a garage erected near the job, while overhauling is done at the company's main shop near Hazleton. Daily operator's reports are compiled to provide a running check on truck performance and to determine timing for major overhauls.

PIONEER STRIP MINERS

The first Dick stripping was opened in 1874, near Hazleton, by Charles R. Dick, grandfather of A. E. Dick Jr., now president of the company. A. E. Dick Sr. formed the present company.

Edward C. Schwartz is general superintendent of the company's operations which include both anthracite and bituminous contracts.



KENNAMETAL

cuts bit costs in half

...produces greater

marketable tonnage

Here's what happened when Pennsylvania Coal and Coke Corp.'s 1800-ton per day Marsteller Mine installed sets of Kennametal Sintered Carbide Bits on its 9 continuous miners. Superintendent Pete Wilson reports that production is averaging 2990 tons per set... that the Kennametal cutting edges can be reconditioned 5 to 6 times. Power consumption is lower, and there is less penetration in bottom rock.

Bit cost per ton has dropped to \$.0050 (less than half that of other bits). Fines in $\frac{3}{4}$ to $2\frac{1}{2}$ -inch screen coal are down $2\frac{1}{2}$ percent — proof of the important increase in this mine's quality commercial tonnage.

These operating efficiencies are possible because (1) tough Kennametal cutting edges have both greater shock and wear-resistance than any other tungsten carbide and (2) Kennametal's advanced tool design provides the proper bits for any cutting job. If you have a cutting or drilling problem, ask your Kennametal Representative to show you how the right Kennametal bit can solve it for you.



Kennametal Sintered Carbide Bits in one of Marsteller Mine's Joy miners. Style UMR4 Bits are used on rotor drum, U4R3 in side chains. Seam: "D", or Freeport.

World's Largest Manufacturer of Tungsten-Carbide

Drill Bits, Cutter Bits, Roof Bits, Strip Bits

Look for the name of your Kennametal Representative in the yellow section of your phone book, or on the back of your Kennametal Price Book — or, write direct.

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Operating Ideas





SHOP-BUILT SHUTTLE CAR carrying 3 tons at a Kentucky mine is now driven by a 7½-hp DC motor. Rear part of body is deeper (right photo) so that the load there overbalances that in the longer but shallower section to provide gravity end dumping.





DURING CONSTRUCTION of 3-ton car, left photo shows frame fastened directly to the rear axle and a body hinge back of the axle. Two transmissions in series are shown in right view, with one 5-hp motor first used in its approximate normal position and the other resting temporarily in the cab.

Shuttle Car Made From Auto Parts Now Hauls 3 Tons

SHUTTLE CARS made from automobile and truck parts are "growing up" and now have a capacity of 3 tons, as compared with the first such cars carrying only 1 to 2 tons. A 3-ton car, built in 1953 by Tuffy's Welding Shop, Paintsville, Ky., is shown above with a normal load of 3 tons (Joy-loaded) at the small truck mine of the Central Coal Co., Van Lear, Ky.

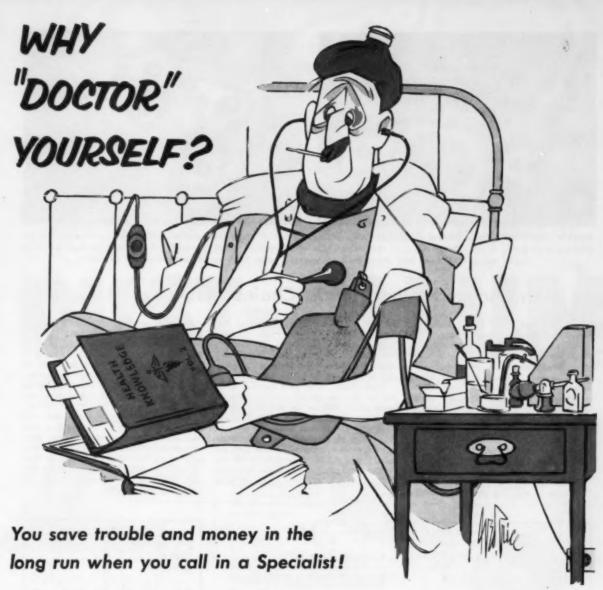
The car frame is the Tuffy steppeddown type, with the rear end fastened directly to the axle without springs and the elevated front end set on springs above the front axle (Coel Age, April, 1953, p 91). When first put in service, the car was driven by two 5-hp 220-v AC motors on the power then available at the mine, which was on hand-loading.

Later, when a Joy 8-BU loader was installed and DC made available by installing a conversion unit, the two 5-hp AC motors were removed from the shuttle car and one 7½-hp DC motor substituted. Tires on the car are 8-ply truck type and axles are from a Ford truck.

At the time the mine photographs were made, late in October, the 3-ton shuttle car was bringing coal from a working place 1,000 ft inby the portal and dumping it 400 ft from the portal, a total haul of 1,400 ft. It is powered through two dragging cables, a 500-ft

length connected to power at a point 100 ft inby the portal and a 200-ft section connected 800 ft inby the portal. When the car reaches 600 ft on the trip into the mine, the operator disconnects it from the 500-ft cable and connects to the 200-ft section.

Cable life in this dragging section is indicated by the fact that some cable sections in use at the time the photographs were made had powered the car for haulage of 16,000 tons. At that time, these cables contained a number of taped splices where repairs had been made or sections of new cable inserted. The mine operates in the Millers Creek seam, which is a coal of a hard blocky type.



Prescribing lubricants for your complicated machines is, in a way, like prescribing medicine for yourself...a single mistake can be fatal. That's why it pays to call in a Specialist for consultation and advice when lubrication problems arise.

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Correct Lubrication
FIRST STEP IN CUTTING COSTS

SOCONY-VAGUUM OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION





MINER CHANGES—Reconditioned yoke (left) with guides eliminated from the bottom half. Arrow points at left to where a new guide is cut off; at right, to the welded end of an applied guide. Revised roller (right photo) has been made into a stationary end piece, with its wearing paths built up to suit individual chains.

With Changed Miner Heads, Chains Last a Year Longer

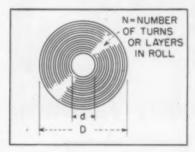
TWO ALTERATIONS in the heads of continuous miners, made in the mine shop, are responsible for getting much longer service from cutting chains, with fewer breakdowns and less power consumed as well, at the Mikegrady mine, Russell Fork Coal Co., Praise, Pike County, Ky. The changes in the roller and guides, worked out by Otis Elswick, chief electrician, made it practical to put worn and discarded chains back into service. Some have given an extra year of 2-shifts-a-day service.

The guides, or wearing strips, on the bottom halves of the five yokes, or "horseshoes," were eliminated to permit the chains to sag, thus preventing wedging and the ultimate tearing out of the wearing strips. As illustrated, the top wearing strip is unchanged. The bottom end of a new wearing strip is cut off and eliminated before the strip is attached and its ends welded to the horseshoe.

Since chains wear in a tapered fashion, as do the guides, leaving off the lower guide relieves the wedging. Operating tests made by the West Virginia Engineering Co. with worn but serviceable chains also show a very large saving in power when sumping—a 350-amp demand for a machine operating with the bottom guides removed, as compared to 700 amp on a machine equipped with guides.

Because of bearing difficulties, the Russell Fork mechanics also found it worthwhile to change the head roller to a stationary end piece by welding it to the end plates. Removing the bearings and their troubles eliminated the spreading of the end plates, which permitted chains to get out of the guides and hang up.

Wearing surfaces of the stationary end pieces are built up by arc welding with No. 680 Eutectic electrode. One great advantage of this is that the wearing path of an individual chain can be built up to bring that chain to its proper tension. Chains of the roller-type head must be of matched lengths.



How Much Belt On a Roll?

HERMAN E. KNIGHT, general superintendent, West Kentucky Div., Bell & Zoller Coal Co., Madisonville, Ky., writes that several times during his practice of mining engineering he has had need for a formula for determining the length of belt in a roll. He was never able to find one, so he developed the following, as a substitute for methods involving calculus, and submits it for use by other readers who may have been faced by the same problem.

$$L = \left(d + \frac{(D - d)}{2}\right) r N$$

L=length of belt, ft d=diameter of hole in center of roll, ft

D = outside diameter of roll, ft N = number of turns on roll

EXAMPLE:

A belt roll has an outside diameter of 4 ft, inside diameter of 00.75 ft and has 45 laps of belt. What is the length of the belt? L=?; D=4 ft; $\pi=3.1416$; N=45.

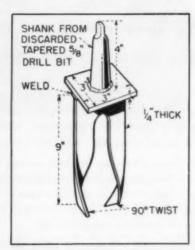
Substituting in the formula

$$L = \left(0.75 + \frac{3.25}{2}\right)(3.1416)45$$

L=(2.37) (3.1416) (45) L=335 ft of belt

Mechanical Stirrer Saves Time

AT LEAST 20 MIN can be saved with this device in preparing a 5-gal can of trolley-wire graphite lubricant, writes Earl K. Baber, mine electrician, Summerlee, W. Va. It was developed by Mr. Baber particularly for use on trolley lu-



bricant that has caked in the bottom of the can and has to be chipped up before it can be stirred. Previously, it took at least 30 min to prepare a 5-gal can for use. In operation, the head of the shank, made from a discarded Morse-tapered %in drill bit, is inserted in a drill press and the lubricant placed on the turn table. It also can be used, of course, to mix settled paint and other substances.

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Rust-Oleum resists rain, snow, heat, fumes, sun, salt water, and chemicals. So easy to use by brush, dip, or spray that one man often does the work of two.

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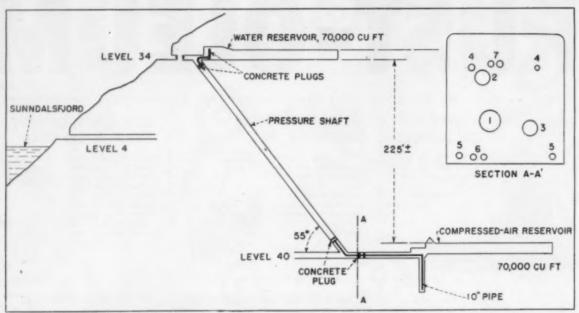


Improved Forge Has Winged Hood to Handle Long Materials

IN SPITE OF THE WIDE USE of acetylene welding, cutting and heating torches, officials of the South-East Coal Co., Seco, Ky., believe that the coal forge is still a practical piece of equipment to have in a modern maintenance

shop. When the shop was built at the company's new Big Chief mine, in Letcher County, a forge of improved design was put at one end of the main room.

As shown in the left photo, the hood normally envelopes the fire so completely that very little heat escapes to bother the forge operator and practically no smoke gets into the room. The front corners are wings, or doors, which can be opened (right photo) to accommodate long materials that must be heated.



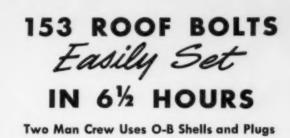
HYDROSTATIC HEAD in inclined pressure shaft confines compressed air in lower chamber and provides constant-pressure air supply to pneumatic tools. Numbered openings in the plug A-A are: (1) inspection manhole, (2) 10-in air line to workings, (3) 10-in water pipe to pressure shaft, (4) 4-in air lines from compressors, (5) discharge pipes, (6) and (7) 1-in water-level indicators.

Underground Receiver Provides Air at Steady Pressure

THE GENERAL SUPERINTENDENT of a Norwegian iron-ore mine solved his compressed-air supply problem by building an underground receiver in which the stored air is held at constant pressure by a balancing column of water, according to an article in Engineering and Mining Journal, a McGraw-Hill publication. Prepared from notes submitted by C. C. Austin, retired general manager of the Mancha Div., Goodman Mfg. Co., while touring Scandinavia, the article points out that Olav Overlie, in charge of a mine at Rausand, Norway, was limited in his operations by overloaded compressors which could not be economically replaced.

To provide the increased air called for in a projected change in mining methods, Mr. Overlie and his men excavated two 70,000-cu ft chambers in solid rock, one above the other, as shown in the accompanying diagram. Each chamber was about 13 ft high with a 225-ft rock interval between them vertically. The chambers are offset, as shown, to eliminate communicating fractures through the intervening rock as a result of blasting in either chamber during construction.

The two chambers are connected through an inclined shaft which is sealed near the top and bottom by concrete plugs. The top reservoir, open to the atmosphere, is filled with water. The water flows out of the reservoir and into the shaft and bottom reservoir by way of 10-in pipes through the concrete plugs. The bottom reservoir, which is the air receiver, is supplied with air from the compressors through the plug at A-A. The compressed air forces the water back out of the lower chamber and up into the pressure shaft, where it acts to maintain constant pressure on the air in the receiver. The plug at A-A also is fitted with an inspection manhole and a 10-in air-discharge pipe to the mine workings. A large volume of cool, clean air at steady pressure from the undersized compressors is the result.



Here's why you can enjoy the same fast bolting:

- All O-B Shells and Plugs are rust-proofed with No-Ox-Id. Your plug threads stay free of rust, even after storage or exposure to acid mine water.
- Protective coating also acts as thread lubricant.
 You can be sure of plugs always turning freely on bolt for fast, correct assembly.
- Flexible fingers of O-B Shells allow bolting units to be inserted in hole easily.
- Fingers of O-B Shells are also pre-expanded and make contact with hole wall. Bolt stays up without holding until you put on tightening socket.

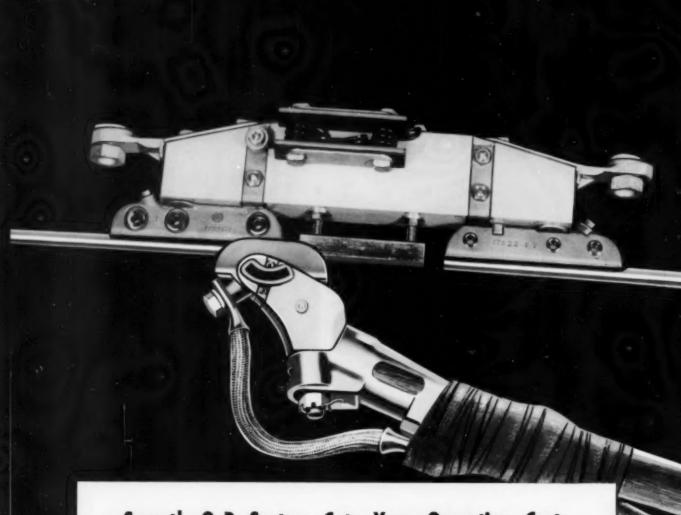
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Smooth O-B System Cuts Your Operating Costs

ENERGIZED CENTER RUNNER on the O-B smooth underrun Type-T Section Insulator is adjustable and you can angle it up or down at either end. Avoids jumping and arcing every time a shoe passes from runner to runner. Helps reduce expensive burning of overhead wire to a minimum. Damage to the Section Insulator is prevented by fused magnetic blowout.

CURVED BEARING on O-B Trolley Shoe keeps your shoe from tilting because of friction . . . keeps it level on wire at all heights . . . equalizes wear along full length of shoe. Streamlined design prevents any part of your collector from snagging on cross beams. Proper depth of groove provides positive "following action."

RUBBER DRAFT GEAR in O-B Automatic Couplers protects your cars from severe jolts. Resilience of rubber takes loads quite often in excess of rated capacity... will compress to absorb blows but always returns to original shape. You don't have to worry about parts flopping around and being snapped by a sharp jerk with thousands of pounds of pressure behind it.

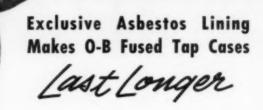
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Do Your Fused Tap Cases Have These 4 Safety Features?

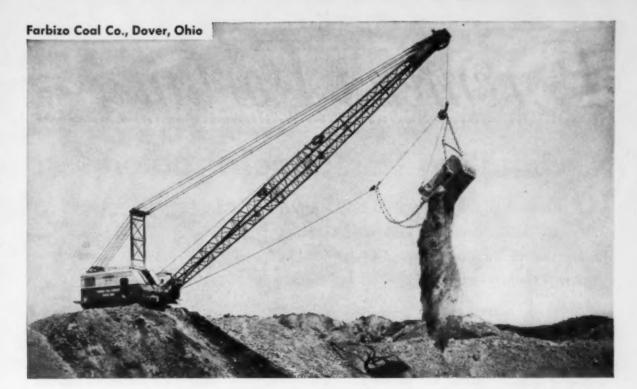
- Exclusive asbestos lining in O-B Fused Tap Cases offers protection from intense heat when a fuse blows.
- Vents at top of O-B case allow flames from exploding fuse to exit safely without endangering any of your workers.
- Threaded and cemented top and bottom inserts safeguard tap case against heaviest pulling force.
- Longer cable hole assures safer spacing between hand and stripped section of cable.

See your O-B representative about top and bottom terminals for the strongest mechanical and electrical connections. Also ask about O-B's heat-tested fused tap contacts.

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IN THEIR TD 24 BULLDOZER TOO, Farbizo relies on heavy duty, high detergent Cities Service DC-300 oil. Heat-resistant, long-lasting and free-flowing DC-300 does the finest job possible.

Twin G.M.C. Diesels in Marion Shovel Give Outstanding Performance!

Here's the story from the Farbizo Coal Co.:

"Following are the pertinent facts with reference to the Marion 111 M Shovel using DC-330 Oil since January, 1951:

"Developed ample power with TWIN G.M.C. Diesels operating at 1550 R.P.M. Operated 16,280 hours with no motor breakage or repairs. Mined 203,000 tons of #5 coal from 36" seam with an average over burden of 35 feet hard pan shale with streaks of iron ore bands.

"Oil consumption 1 pint per week, oil and filters changed weekly. Consumption is same as when shovel was new. Motors were recently inspected but no repairs or replacements needed. Unusual performance praised by G.M.C. and Marion Shovel representatives.

"Similar results using DC-300 Oil in two Gradall shovels and International TD 24 Bulldozer."

Let Cities Service lubricants protect the important investment you have in your machinery. Call your nearest Cities Service representative or write Cities Service Oil Co., Sixty Wall Tower, New York 5, New York.



Foremen's Forum

Handling Personnel Problems

The good supervisor is a teacher, a leader and a judge. He makes decisions only after weighing facts, he accepts his men as dignified individuals and they work well for him because he makes them want to do so.

By TRENT H. KEMP, Personnel Trainer Jewell Ridge Coal Corp., Tilford, Ky.

A MAN IS KNOWN BY THE COM-PANY HE KEEPS and a company is known by the men it keeps. Proper handling of personnel problems has direct bearing on the men you keep. Handling personnel problems may not be pleasant, but it is significant. In our relations with employees, we no longer have the power to say "yea" or "nay." We have had to adjust ourselves to all kinds of restrictions upon what we may or may not discuss with or do for our employees.

Perhaps one of the most disturbing signs of our times is a widespread lack of willingness to work. In reading an analysis of the fall of France, one is struck by the fact that while the French were insisting on a 30-hr work week, the Germans across the Rhine were working 70 hr a week. The differential in production largely spelled the downfall of France in spite of the imagined security of the Maginot Line. This trait, if permitted to develop in our people, could as easily mean an economic downfall for us in spite of the imagined security of all our modern machines and scientific methods of production.

Likewise, the future of our company or industry does not altogether depend upon the size of the business, the number of properties or the degree to which scientific methods of production are employed.

OPPORTUNITY IN A CRISIS

The real nature of the crisis in labor relations is not revealed in detailing the disastrous consequences. The Chinese word for "crisis" contains two symbols, one meaning danger, the other, opportunity. As we face up to the dangers in labor relations, we may discover some of the underlying causes and the opportunities for removing them.

Charles Schwab, the famous steel mag-

Adapted from a paper presented at the Kentucky Mining Institute, November, 1953. nate, said, "I consider my ability to arouse enthusiasm among men the greatest asset I possess . . ." Like Schwab, we must have real concern for human relations because it translates itself into job enthusiasm on the part of the employee. Taking two companies with similar conditions and equipment and with the same skills at their command, the one with an organization filled with enthusiasm for what the company is trying to do is bound to forge to the front.

There is only one way under high heaven to get anybody to do anything. That is, by making him want to do it. Of course, you can make a man want to give you his wallet by sticking a revolver in his ribs. You can make an employee give you co-operation—until your back is turned—by threatening and raising "old Harry." But these crude methods have undesirable repercussions.

No matter how carefully the people in an organization were selected, they cannot run themselves. As supervisors, how are we to translate ideas and ideals into definite actions for the organization? The factors that contribute so greatly to making our people want to work are for the most part within the supervisor's power to manipulate. If we want our thinking about job relations to be constructive, there is but one concept that should underlie every human-relations problem. It is simply, our people are individuals—living individuals with pride that can be hurt, nerves that can be jangled, hopes that can be raised and ambitions that can be stirred.

THE MASTER CRAFTSMAN

The master craftsman will build a team out of his workers, a team with the supervisor as the quarterback, providing the enthusiasm, encouragement and stimulant. This presents the two-edged problem of getting production while maintaining human decency.

The operating supervisor must face this problem every working hour of his day. He must have thorough knowledge of his work and his responsibilities. To the people who work for him, he is management. Top-management confidence, therefore, is prerequisite to a good supervisory job.

Concerning ability to teach, the supervisor may have a complete knowledge of his work and his responsibilities, but unless he possesses skill in instructing he cannot transfer his knowledge to his men. Poor performance can occur at any level or among people of any degree of experience. It may be due to a supervisor's inability to instruct employees or failure to give directions and leadership.

THE TEACHER-SUPERVISOR

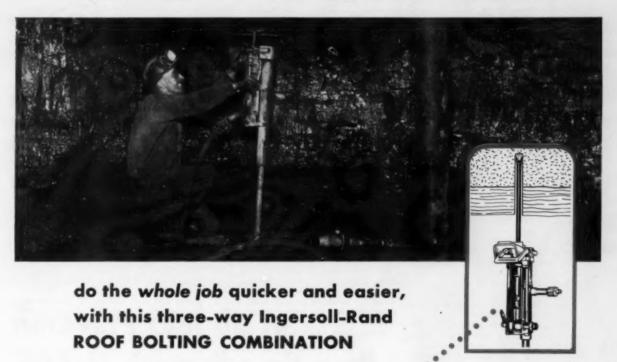
A worker may honestly think he is doing a good job because, as he views it, there just isn't any way he could do it better. If the boss approaches him and says, "Now I am going to teach you your job," he will be resentful. As soon as the boss leaves, however, he seeks out every conceivable way to pick up knowledge. Sometimes there is another worker who will give him a hand without embarrassing him; often as not, he just bluffs or staggers along. Underneath, he usually is wishing more than anything in the world that someone would teach him the job without making it obvious.

Most of us concede the need for training new people, some of us see the need for training old employees when they are given new work, but only a few look at training as part of everyday operations. Actually, the more anyone knows, the more help he needs in order to measure up to what is expected of him. Furthermore, experienced workers often develop had work habits.

THE LEADER-SUPERVISOR

Instruction alone is not enough, however, since good supervisors must also provide for every man the personal leadership that merits their co-operation and develops teamwork. Skill in leading people is the most important characteristic of a good supervisor, and perhaps the most difficult to develop. In the first place, dealing with people presents this two-fold problem: The supervisor must deal in facts and at the same time deal in opinions and feelings that have the force of facts. Since these opinions and feelings occur inside people, talking to them about these matters is a com-

FOR "LOW OVERHEAD" in ROOF BOLTING



RP-38 "SHORT-LEG" STOPER, for drilling bolt holes and driving wedge type roof bolts. The light weight and excellent balance of this ultra-compact stoper permit easy handling in seams as low as three feet. It has positive, automatic rotation for fast bolt-hole drilling and plenty of power for driving the bolts into the hole. For extra-heavy drilling, the slightly larger Model RP-48 Stoper can be used.

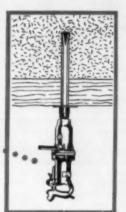
SIZE 534 IMPACT WRENCH, for tightening and locking the roof bolts. This heavy-duty air powered tool gives a far greater torque impact than any other portable wrench of its size and weight. Extra deep sockets are available to permit tightening nuts over extended bolt ends.

CARSET JACKBITS, for faster, easier drilling in any type of ground. These bits, with super-hard tungsten carbide cutting edges, practically eliminate bit changing—have no appreciable gauge wear, increase drilling speed 50% or more. Steel bits a vailable where needed.



Ask your I-R representative for complete information on this service-proved Ingersoll-Rand Roof Bolting Combination.







ROCK DRILLS . COMPRESSORS . AIR-TOOLS . CENTRIFUGAL PUMPS . TURBO BLOWERS . CONDENSERS . DIESELS . GAS ENGINES

COAL AGE · February, 1954

plicated affair. Here is advice from Henry Ford. "If there is any one secret of success," Mr. Ford said, "It lies in the ability to get the other person's point of view and to see things from his angle as

well as from your own."

Jumping to conclusions before getting the other person's point of view most likely will result in a skirmish over arguing points that have nothing to do with the real cause of the problem. You can bet your bottom dollar the real battle will come at a later date, reinforced by the heavy artillery of the entire working force. The worker is certain to come away from such a battle victorious. If for no other reason, he will have found someone who will listen to his story and have regard for his personal opinion.

GIVING DUE CREDIT

Many personnel problems arise because the worker does not know how he is getting along in an important thing like his job. We all like to know how we are getting along. Operating supervisors must take the responsibility of recognizing workmen for any extra effort they put into their jobs.

Changes that affect workers often result in personnel problems. Many of these could be avoided by telling workmen in advance about changes that will affect them. All of us like to be told of changes and we like to be told why

the changes are necessary.

It is true, also, that a workman may become dissatisfied. Consequently, he is "swell timber" for some outside influence to harmfully channel his thinking. We all like to work somewhere near our top ability. Standing in a man's way most likely will kill his ambition. Since his top ability can be had for the asking, why not use it to mutual advantage.

These basic principles, when applied day in and day out, will tend to keep relations smooth and prevent many problems from arising. However, the changes, interruptions and failures that occur and the situations that arise will cause problems. Good supervisors catch these problems early and deal with them in such a manner that they will not be magnified, thus cultivating the seeds of job enthusiasm instead of permitting the weeds of contempt to grow into gripes, grievances and strikes, with all the difficulties they entail.

A CASE HISTORY

Let's take a look at how one foreman handled one of his problems.

John Doe was a good loading-machine operator and his earnings were high. The mines were on a 4-day schedule, and some time ago, John had fallen into the habit of laying off. His absence curtailed production. The foreman spoke about it to John, but John said, "Oh, I'm making more money now in three days than I used to make in two weeks." The foreman tried to talk about loyalty to the company, but he did not get any place. Then John Doe was married and began to work regularly. The foreman decided that now the extra money looked good to

John, and that was why he worked all the time. John kept up the good record for two or three months, then one Monday a 5-day schedule was announced. On Tuesday John failed to come to work. The foreman decided that John figured he could get along on four day's pay and he would teach him a lesson by showing him how it would feel to lose five day's

On Thursday when John came in, the foreman was waiting near the lamphouse. He called out, "Hey, John, don't bother to get your light. I'm laying you off for a week. In the meantime, you will have a chance to look over what's in your pay envelope. Maybe you'll decide it won't be so bad to get five day's pay next time." Without saying a word, John turned and walked away.

This foreman had a problem, didn't he? Would you have taken similar action?

The foreman made no attempt to find out why John failed to report for work Tuesday and Wednesday. He jumped to the conclusion that John, in spite of his apparent change, was irresponsible. The contents of the pay envelope was all that mattered. So he sent John home.

It isn't hard to guess what happened the following Monday. The mine committee came to the foreman and said, "You have been pretty tough on John Doe, haven't you? His father was hurt in an accident last Monday night. John asked his neighbor to send word to the mine that he was called away. The neighbor forgot."

When John came back to work on

Thursday, he did not know that the foreman had not been notified of the reason for his absence. Do the additional facts throw more light?

WEIGHING FACTS

The stakes are too high to take action on any problem without first getting all the facts, by reviewing records, checking rules and customs, and talking to the individuals concerned. What a worker thinks, right or wrong, is a fact to him and must be considered as such. The temptation to jump to conclusions is great. All the facts must be carefully weighed; they must fit together to tell the whole story. Only then should action be taken.

After action has been taken, it doesn't necessarily mean the objective has been accomplished. The results of such action must be measured in terms of output, attitudes and relationships. The acid test is, did the action help production?

Skill in instructing and leadership long have been recognized as marks of a good supervisor. Good supervision means that the boss gets every man to do what he wants done, when it should be done, the way he wants it done because they want to do it.

We must constantly prod ourselves into remembering that job enthusiasm among employees is something that always reflects in terms of production, safety and cost, and can be had almost for the asking. It will always be the brightest badge of a working citizen in

A Footnote for Top Management:

If He Asks a Raise . . .

a free society.

Every ambitious, worthwhile employee [foreman] expects to advance in salary as he gains experience in your company.

It might be well when you take on a new man to talk over with him some of the intangibles that determine a man's value to the firm.

Then he will understand that much more is involved than just the amount of work he turns out.

Max H. Keyes in the Office Executive discusses what he calls "certain general gages" for determining one's own worth to his employers.

The first is the question: "Can you honestly say that top management respects your ability and judgement?"

The second: "Have you won and are you holding the respect of your fellow workers?"

Third: "Do the persons who work under you give their best effort and co-operation?"

Fourth: "What is your own honest opinion of yourself? Are you a valuable man—not just a cog?"

If your employee can answer these questions to himself with an assured affirmative, he has a right to ask you for a raise.

Probably, however, you've beaten him to it.

-The Consol Dealer

COMPTON Model 48 Coal Auger



Recovers coal up to 208 ft. from the pit wall

... regardless of overburden

The Compton Model 48 Coal Auger is designed to give you maximum efficiency at low cost. CHECK THESE FEATURES!

- 1.—Auger sections racked on frame—ready for transfer to operating position by hydraulically controlled synchronized winches in a matter of seconds.
- 2.—Hydraulically-operated pilot pan eliminates spillage between machine and high wall.
- 3.—Entire unit is self-contained including elevating conveyor.
- Hydraulically-controlled swivelling discharge turret chute permits uniform trimming of trucks.
- 5.—Hydraulic jack legs (with self-leveling pontoons for better floatation) permit drilling up to 208 feet without misalignment ... also permits drilling vertical overlapping holes for varying seam thickness.

COMPTON CUTTING HEAD

EXCLUSIVE WITH COMPTON AUGERS...
BUILT-IN SPIDER ASSEMBLY ON NON-CLOGGING HEAD RESULTS IN INCREASED PRODUCTION BY DRILLING STRAIGHTER HOLES
WITH LESS FRICTIONAL DRAG.

MODEL 48 SPECIFICATIONS

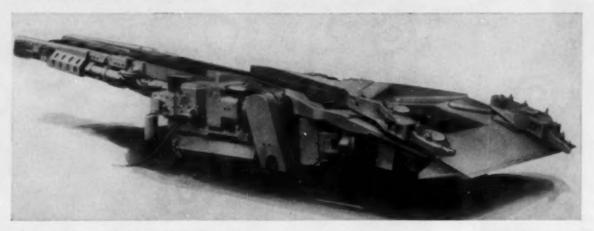
Length: 48 feet; Weight: Approx. 36 T.
Carries eight 26 feet auger sections.
Required pitwidth: 50 feet
Power: 300 HP Diesel Engine
Hydraulic frame jack lift: 66" or 120"
Auger diameters: 28" to 48"
Possible drilling depth: 208 feet

Consult a Compton Engineer for Details

Compton, Inc.

BOX 1946 - PHONE 4-6384 CLARKSBURG, WEST VIRGINIA

Equipment News



New Crawler Loader Mines up to 10 Tons per Minute (1)

The newly developed Jeffrey ML-81 crawler loader, designed to operate in coal seams of 38 in and up, is available in four models, with machine heights of either 32½ or 36 in and head and traction motors of either 10 or 15 hp. The loading head is full gear-driven on all models. According to the manufacturer, the ML-81 will have a rated loading capacity of

8 tons of coal per minute with 15-hp motors and 6 tpm with 10-hp motors. Maximum loading capacities are 10 and 8 tpm, respectively. Both low and high models are 6 ft 2 in wide and 23 ft 8 in long. With 10-hp motors, the ML-81 will tram at 114 fpm; with 15-hp motors, 137 fpm. Circle No. 1 on the card for details from Jeffrey Mfg. Co., Columbus 16, Ohio.



Tandem-Axle Units New to 1954 Truck Line (2)

The 1954 Ford truck line offers the first tandem-axle units ever built by Ford, the Series T-700 and T-800 trucks with gross combination weights up to 60,000 lb, factory-built and engineered for tandem operation and designed for mining and other off-road and highway work. The five truck lines offered by Ford for 1954, including 24 series and over 220 models ranging from 4,000 to 40,000 rated gvw, are powered by five new short-stroke, low-friction, high-economy truck engines developing from 115 to 170 hp. Ford's "Master-Guide" power steering is available on the larger units, with "Fordomatic" automatic transmission on all light models. Two new cab-forward series, the C-700 and C-900 "Big Jobs," offer gcw ratings up to 55,000 lb. The T-700 tandem-axle truck, rated to carry a 5- or 6-yd dump, is powered by a 138- or 152-hp engine, and has a maximum gcw of 42,000 lb. The T-800 is powered by a 170-hp engine and rated to carry a 10-yd dump. Both have four wheelbases up to 192 in. Full details from Ford Motor Co., Box 638, Dearborn, Mich.



3/4-Yd Shovels Offer Two Mountings (3)

Featuring a completely new design with safer and more efficient cab styling and various mechanical innovations, two new %-cu yd power shovels, crawler or truck mounted, have been added to its "Michigan" line by the Clark Equipment Co., Buchanan, Mich. The shovels are the Model C-24 crawler unit (shown operating as a dragline); and the Model T-24 truck-mounted unit, with either a 8x4 or 8x6 drive. The first new shovels to be added to the line of the Michigan Power Shovel Co. since it was acquired by Clark Equipment last May, the %-yd units supplement the ¼- and %-yd Michigan models and will be followed by other new products, the company reports. Details from Clark Equipment.

USE the postage-free card facing p 136 for free bulletins and more data on the new equipment listed in this section.



New Chevrolet Trucks for '54

Loaded with brand-new advantages you need and want!

You'll get more work done in less time and at lower cost with new '54 Chevrolet trucks on the job. They bring you more new features... more big new advantages than any other truck on the road.

For example, you get new engine power in all models. The advanced "Thriftmaster 235" engine combines bigger displacement and higher compression with other new features to give you greater power and finer performance. The rugged "Loadmaster 235" engine offers increased strength and stamina for heavier trucking operations. The all-new "Jobmaster 261" engine brings you extra reserves of high-compression power for hauling big loads on schedule.

In addition, you enjoy new and even greater operating economy. All three 1954 Chevrolet truck engines bring you the full benefit of thrifty high-compression power.

And there are many, many more new things you'll like about these great new Chevrolet trucks. New, roomier pickup and stake bodies let you haul more . . . save you time and extra trips. And they're set lower to the ground for easier loading

and unloading. New truck Hydra-Matic transmission* lets you drive all day without shifting. It's offered not only on ½- and ¾-ton Chevrolet trucks, but on 1-ton models, too. New Comfortmaster cab with one-piece curved windshield and amazing new Ride Control Seat* offers the last word in comfort, convenience and safety.

Plan now to see your Chevrolet dealer and get all the facts about the new Chevrolet trucks for '54.... Chevrolet Division of General Motors, Detroit 2, Michigan.



CHEVROLET ADVANCE-DESIGN TRUCK FEATURES THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thrift-master 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. NEW TRUCK HYDRA-MATIC TRANSMISSION*—offered on ½-, ¾- and 1-ton models. Heavy-Duty SYNCHRO-MESH TRANSMISSION—for fast, smooth shifting. DIAPHRAGM SPRING CLUTCH—improved-action engagement. HYPOID REAR AXLE—for longer life on all models. TORQUE-ACTION BRAKES—on all wheels on light- and medium-duty models. TWIN-ACTION REAR WHEEL BRAKES—on heavy-duty models.

DUAL-SHOE PARKING BRAKE—greater holding ability on heavy-duty models. NEW RIDE CONTROL SEAT* eliminates back-rubbing. NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES—give increased load space. COMFORTMASTER CAB—offers greater comfort, convenience and safety. PANORAMIC WINDSHIELD—for increased driver vision. WIDE-BASE WHEELS—for increased tire mileage. BALL-GEAR STEERING—easier, safer handling. ADVANCE-DESIGN STYLING—rugged, handsome appearance.

*Optional at extra cost, Ride Control Seat is available on all cab models, "Johnaster 261" engine on 2-ton models, truck Hydra-Matic transmission on ½, , ¾- and 1-ton models,

MORE CHEVROLET TRUCKS IN USE THAN ANY OTHER MAKE!



Cylindrical Cyclone Offers Greater Coal Recovery (4)

A new-type cylindrical cyclone said by the maker to do a better job of eliminating fine clay from undersize coal has been introduced by the Equipment Engineers, Inc., 41 Sutter Pl., San Francisco, Calif. Working on plus 150-M coal in coal-clay slurries of about 25% solids, the Model EE cyclone produces a clean product at relatively low horsepower, with practically no loss of coal, the company reports. It operates particularly well in coal-clay slurries where the desired product is larger in size but has a lower specific gravity than the contaminant.

The unit is a two-stage cyclone consisting of integrated 10x18-in primary and 4x10-in secondary cylinders. Outstanding features of the cylindrical shape cited by the maker include: reduced wall friction, which provides increased separation efficiency in relation to power and capacity; and reduced wear because coarser particles are not held in the lower section. Single- and dual-overflow units with capacities of 130 to 225 gpm, selling at \$750 to \$900, now are available and larger units are being developed. Details from company.



PORTABLE METER MEASURES SURFACE MOISTURE (5)

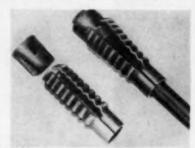
The Olivo moisture meter, designed as an accurate portable instrument for measuring surface moisture in powdered, granulated or fibrous material, now is available in the U.S. exclusively through Heyl & Patterson, Inc., Pittsburgh 22. Fully portable, simple and easy to operate, the Olivo moisture meter can determine the surface-moisture content of material in less than 2 min and is accurate to 2% of the results obtained with standard air-dried surface-moisture tests, the company says. To operate the device, pour into the meter a determined quantity of the material under test, add the vial of calcium chloride provided, shake to break vial and mix its contents, and then read the moisture content on the indicator. After wiping out, the meter is ready for another test. Full details from Heyl & Patterson.



SOUND RECORDER REPEATS SAFETY MESSAGES (6)

Adaptable to many uses in safety promotion and employee communication,

the new Audio-Vendor-an automatic, audio, message-repeating device-serves as an always-on-the-job warning and may be activated by remote control to automatically and continuously repeat messages of from 15 sec to 15 min. Essentially a magazine of magnetic tape that fits any standard tape recorder, the Audio-Vendor can be activated by a photo-electric cell, floor mats or driveway hoses, with the speaker placed in the most effective spot to transmit warning messages recorded to suit each situation. Plants with public-address systems can also use the Audio-Vendor for messages and emergency warnings. The Audio-Vendor is especially economical, for new messages, warnings, etc., automatically wipe off the tape as they are recorded and new recordings are then broadcast continuously until they are replaced, the maker points out. Bulletin with full details from Cousino, Inc., Toledo, Ohio.



EASIER INSTALLATION FOR BOLT ANCHOR (7)

"Roof-Lock" alloy-steel expansion anchor for roof bolting, in addition to such advantages as corrosion resistance, high spring-steel holding power and fatigue resistance, now offers simplified operation and lower bolt cost through the use of newly developed "Plug-Lock," the maker reports. The plug is cast with depressions which are gripped by two fingers of the steel expansion anchor to provide a gripping action that holds the plug in position for fast, positive starting and prevents the outer assembly of the expansion anchor from dropping down the bolt during the installation or tightening operation. At the same time, all four fingers of the expansion anchor, de-

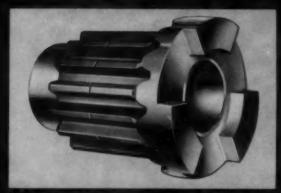
signed to fit a standard 1%-in hole, firmly grip the sides of the hole. Details or test samples from Mining Products Div., Equipment Corp. of Amer., Cleveland 14.



MERCURY-RECTIFIER DRIVE FOR ADJUSTABLE-SPEED USE (8)

New Reliance Electric mercury-rectifier variable-voltage pre-engineered power drive designed for a broad range of applications requiring adjustable-speed service, called the "Reliance Xatron V°S Drive, utilizes mercury-arc rectification with a newly developed single-anode mercury-pool rectifier tube known as an "Xatron" to provide the full range of flexibility and other important operational advantages of a DC motor drive without the necessity for a DC distribution system and a central AC-to-DC converting installation. The first size available, operating in a three-phase bridge arrangement, provides conversion suitable for 30-, 40- and 50-hp drives and is also expected to find uses in several other fields besides voltage-controlled drives. The new unit consists of the operator's control station, adjustablespeed drive motor and control unit. Operational advantages cited by the maker include: wide speed ranges, smooth and powerful starting, stepless acceleration, close speed regulation, fast response, high over-load capacity, conveniently centralized control, power applied directly, quiet operation, savings in floor space, installation economy and minimum maintenance. Full data from Reliance Electric & Engineering Co., Cleveland 10.





Next time you need replacement parts, specify those made by TOOL STEEL... and watch your dragline deliver more "walking miles" per dollar.

Write today for complete information

time" on draglines as a result of pinion breakage. Worn out walking pinions were replaced with pinions made by TOOL STEEL. They've delivered twice as many walking miles as competitive pinions and are still in operation.

TOOL STEEL'S tremendous background in the treatment of metals has developed the hardest toughest material for any service.

TOOL STEEL, since 1909, has delivered to Industry thousands of hardened parts of every conceivable size, shape and service requirement.

TOOL STEELS metallurgical department, superb plant facilities and field service reports all combine to keep TOOL STEEL well ahead of competition, maintain its recognized superiority.

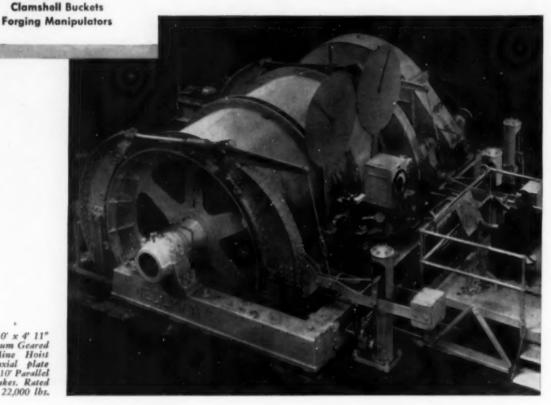
TOOL STEEL
GEAR AND PINION CO.
CINCINNATI 16, ONIO, U. S. A.

Wellman will build it

Special Cranes
Mine Hoists
Car Dumpers
Gas Producer Plants
Ore Bridges
Charging Machines
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Skip Hoists

Wellman electric mine hoists

give dependable performance all over the world



Wellman 10' x 4' 11" Double Drum Geared Electric Mine Hoist with 7' axial plate clutch and 10' Parallel Acting Brakes. Rated rope pull: 22,000 lbs.

• For more than half a century, in mines all over the world, Wellman Electric Mine Hoists have been used because they combine expert design with expert construction . . . featuring all the "modern improvements" developed in our many years' experience. Wellman Mine Hoists provide maximum safety, peak economy, and trouble-free operation under a wide variety of conditions. Let us give you recommendations for hoists that will do your job most satisfactor:ly.

THE WELLMAN ENGINEERING COMPANY

7012 CENTRAL AVENUE

CLEVELAND 4, OHIO



This Grease Stopped Overheating of Bearings!

says Mr. Beeler, Sunlight Coal Company, Boonville, Ind.

When you've got a lot of money tied up in a piece of equipment—as does the Sunlight Coal Company, you can't afford idle time caused by burned out bearings.

Mr. Beeler writes, "Our Marion Dragline #7800 is protected by Sinclair Lubricants... from dolly rollers to hoist cables. Experience has proved to us that Sinclair HEAVY DUTY BEARING GREASES put an end to overheated bearings. Sinclair GEAR PROTECTIVE COMPOUND gives us all-weather performance—and Sinclair JET LUBE #20 maintains a better film on dolly rollers and track."

Mr. Beeler continues, "The important advantage to us is that Sinclair Lubricants provide optimum performance in heavy mining operations over the broadest range of temperature and weather

Let Sinclair Lubricants help you get all the life and working hours out of your equipment. Phone your local Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR LUBRICANTS

conditions."





Is wear your enemy?.. Then send for this book!

If you are looking for long-lasting chains that defy wear and help you reduce replacement costs, you'll find this new catalog a valuable aid.

Kenkrome chains are designed to help you fight wear. First, Kenkrome is the ideal metal for chains ... an already-hard manganese alloy steel that grows even harder when it's subjected to wear and abrasion. Second, many of the chains described in this catalog are of improved design... heavier,

reinforced, but perfectly interchangeable with the standard chains you are now using.

Pintle, Rivetless, Detachable Link, Combination, Drag, Roller and Bar Link type chains are all described here. Kensington's famous renewable-tooth sprockets, also made from wear-defying Kenkrome, are likewise included. In these days of high operating costs, it will pay you to keep this valuable catalog handy for ready use.





Mail the coupon for your free copy today!

KEL'SINGTON STEEL COMPANY, Dept. C, 505 Kensington Ave., Chicago 28, III. A SUBSIDIARY OF POOR A COMPANY, CHICAGO

Please send me free copy of new 1954 Kenkrome Chain Catalog. I understand I will be under no obligation.

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ENSIGN MINE EQUIPMENT

MO

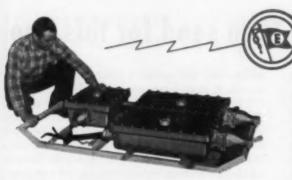
** REDUCE OVERHEAD, INCREASE PROFIT!

Current economic conditions in the mining field call for greater-than-ever efficiency. Ensign equipment is designed and manufactured to give extra years of dependable, trouble-free service.



ENSIGN-CLARK STARTER

Bulletin 5392 Type ADJR EXPLOSION TESTED starter for 2-speed conveyor belt is shown above. Has adjustable speed 2 to 1 ratio when used with adjustable speed motor. Three position selector switch provides independent or sequence operation. Interlock on reversing switch gives half speed only on reverse. Full field on starting. Field accelerating relay provides speed-up from remote push-button for shuttle car loading.



ENSIGN DISTRIBUTION BOX

This PERMISSIBLE unit has 3 circuits — is suitable for cutting machine, loading machine and drill. Enclosures are heat-treated aluminum alloy with heat-treated aluminum cover plates. This gives light weight, rugged construction. Boxes incorporate three-pole circuit breakers with shunt trip attachment for tripping breaker plus ground current limiting device. Has Ensign safety lever action plugs. Design permits use of standard three conductor mining cable. Also available in dust-tight enclosures.



THE WATCHDOG OF YOUR CONVEYOR SYSTEM

Ensign Centrifugal Switches for belt conveyors provide belt protection and sequence operation of multiple conveyors including shaker or chain conveyors feeding onto belt conveyors. Bulletin 1100 Centrifugal Switch, left above, has dust-tight enclosure. Bulletin 1101, right above, has explosion tested enclosure.



FAST WELDING METHOD (15)

An extremely simple, inexpensive noz-zle adapter for the conventional semi-automatic or "squirt" welder permits the deposit of various alloys at speeds far higher than can be obtained by ordinary manual welding, even exceeding the deposition rate achieved by the full automatic electric welding head, the maker reports. In effect, the process utilizes the magnetic field created by the passage of the electric current through the bare electrode, plus a magnetic alloy flux which coats the wire immediately ahead of the welding arc. As applied to buildup and hard-facing, the magnetic process provides much higher deposition rates, and deposits are sound, with the con-sistency and unformity characteristic of the automatic welding method. Welding time and material costs are markedly reduced and the magnetic process eliminates considerable waste, since all the flux applied to the wire is consumed, thus making unnecessary flux recovery equipment and screening for re-use, it is said. Literature describing the alloy flux and the adapter nozzle is available from the Stoody Co., Whittier, Calif.



VERSATILE 1/2-YD TRACTOR (16)

New versatile, multi-purpose Oliver "OC-3" Tractor-Loader features all-hydraulic operation, extreme bucket rotation that permits dumping from ground level to full lift height of 10 ft 9 in, digging to a depth of 16 in below track level, or use of the bucket for leveling, scraping and stripping operations. Bucket capacity is ½ cu yd and lifting capacity is 2,000 lb. Versatility of the unit is emphasized by the quick and easy addition without special tools of several attachments that makes the Tractor-Loader a bulldozer, backfiller, lifting boom, lifting fork or snow plow. It can be quickly moved from job to job by only a light trailer or truck. Details from Oliver Corp., Chicago 6.

SIMPLIFIED LEVEL CONTROL FOR STORAGE BINS (17)

Scrayco level control offers dependable, trouble-free control of coal and other materials in storage bins, ducts or chutes, etc., the maker says. The unit consists of a completely sealed housing placed on the outside of the bin which contains an electrical switch connected through a spring to a flexible rod, or

THE POSTAGE-FREE CARD
. . . facing p 136 will bring you details on items in this section.





"ORIENTED" DIAMONDS

Make Sprague & Henwood Bits

CUT FASTER-LAST LONGER

Always a leader in its field, Sprague & Henwood, Inc. PIONEERED the development of ORIENTED Diamond Bits; in which each individual diamond is set with its hardest rib or "vector" toward the work.

As of the present date we have produced more than FIVE THOUSAND oriented bits, in a wide variety of types and sizes, with both cast and powdered-metal matrices; and have proved, by extensive comparative tests in our own contract drilling operations, that they cut much faster and last much longer than bits in which the diamonds are set at random.

Only selected diamonds of certain crystalline structure can be used and only specially trained and equipped setters of more than usual aptitude can be relied upon to orient diamonds correctly in the mold, but we are now fully organized for efficient production of ORIENTED DIAMOND BITS, at no additional cost to the purchaser.

In terms of footage cost, these are the most economical diamond bits ever produced and we invite inquiries on that basis. Bulletin No. 320 illustrates and describes all types and gives complete working data.

CONTRACT DRILLING

We do drilling by contract and are one of the oldest and largest contractors for any type of core drilling. Experienced crews are available on short notice for service anywhere in the United States and many foreign countries. Estimates submitted promptly on request.

Sprague & Henwood, Inc.

Branch Offices: New York, Philadelphia, Pittsburgh, Grand Junction, Colo., Buchans, Newfoundland



"sensing probe," which extends through a flexible rubber sphere downward into the bin. The rod, coming in contact with the flowing material, moves freely within the flexible sphere to actuate the spring which in turn throws the switch that cuts off the flow at any desired level. Maintenance is eliminated since dust or moisture cannot reach the controls and only the rod comes in contact with ma-

terial, it is said. Full details from Scrayco, 201 Greene Ave., Bound Brook, N. J.

BELT SCALE FOR LIMITED CLEARANCE (18)

New offset Transportometer weighing scale for use on new or existing belt conveyors where overhead clearance is limited is designed with weight integrator scale levers and suspension framework all located under the conveyor and the weight integrator, mounted in a dusttight cabinet, located on either side of the conveyor. All Transportometers, including the new unit, employ a standard, completely mechanical, gear differential integrator which automatically and continuously records the product of the belt speed and the momentary weight passing over the scale suspension, with a weighing accuracy over its entire range of 994% or better, regardless of belt speed or tonnage variations, the maker says. Details from the Transportometer Div., Sintering Machinery Corp., Netcong, N. J.

Equipment Shorts You'll Want to Check

(19) ADJUSTABLE FOG GUN developed by Bete Fog Nozzle, Inc., Greenfield, Mass., is instantly adjustable from a soft conical fog to a hard driving jet by turning a rubber-gripped handle to provide wide- or narrow-angle fog cones with any desired coverage or drive the maker says. Made with garden-hose thread, the new Model H5G is designed for fire protection, spraying insecticides and weed killers and other applications, operating at pressures from 30 to 150 psi and made of bronze and other non-corrosive materials.

(20) FLEXIBLE DUCT — "Portovent," said by the maker to be a new inexpensive, easily-handled flexible duct designed for handling air, dust or fumes, is made from cotton or nylon fabrics impregnated with neoprene compound and reinforced with spiral wire. It features excellent airflow characteristics, large cross-section even on sharp bends and wide pitch between wires for flexibility, retractability and reduced weight. Portovent is supplied with inside diameters of 4 to 36 in in any desired lengths and can be cut easily in the field. Details from the Flexaust Co., New York 17.

(21) ALUMINUM COUPLINGS and fittings for grooved aluminum pipe, announced by Gustin-Bacon Mfg. Co., Kansas City 6, M.s., are designed for use wherever extremely light high-pressure pipe systems are needed. The 8-in aluminum Gruvagrip coupling weighs less than half as much as a similar malleable-iron coupling, the maker says. Available in 2-, 4-, 6-, and 8-in sizes, the new reusable couplings automatically absorb expansion and contraction, shock, ground motion, vibration, and end pulls up to 46,000 lb; permit layout misalignment up to 3 deg; and are suitable for permanent or temporary lines, it is said. Details from company.

(22) WETTING AGENT—Newly developed "Monawet Mo," a wetting agent of the dioctyl-sodium-sulfosuccinate type, has proved highly effective wherever penetration, wetting-out or depression of surface tension are required, the manufacturer reports. Bulletin 212 with details offered by Mona Industries, Inc., Patterson 4, N. J.

(23) AIR COUPLER—Lightweight Lincoln Quick-Detachable air coupler is said by the maker to offer 35% greater air flow, featuring an extra large air passage that permits flow of 70 cu ft of free air per minute at 150 psi, and instant coupling or uncoupling with one push or pull. Automatic air check valve shuts off flow of air instantly when coupler is detached from nipple and free swiveling of coupler on nipple prevents kinking of air hose. More information from Lincoln Engineering Co., St. Louis 20, Mo.

(24) ELECTRIC MOTORS—Outstanding moisture resistance has been imparted to General Electric's newly-announced Tri-Clad "55" motor by treatment with a new silicone Dri-Film water-repellent coating. It has extended life of the polyphase AC motor line six times by preventing formation of continuous moisture film on coils, the company reports. G-E engineers report that air-drying treatment with the silicone enables the Tri-Clad motor to withstand salt-spray tests better then any other system employed. General Electric Co., Schenectady 5, N. Y.

(25) AIR SAMPLER developed in AEC laboratories and manufactured by The Staplex Co. for that agency now is available to industry for sampling large volumes of air for particulate matter by means of a filter paper. The sampler has been used successfully to sample air containing particles as small as one-hundredth of a micron in diameter, the





J&L Jalloy Heat-Treated Plate is the general purpose steel that is heat treated to provide longer wear on applications where impact and abrasive conditions are severe.

In comparison with other abrasion-resistant steels as well as mild steels, it gives optimum results when heat treated to a Brinell hardness of 340 and up. Jalloy permits savings in steel costs, maintenance, and repair. Furthermore, it is easily welded.

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The unit, owned by Birchfield Mining Co., of Coeburn, Va., is working a five-foot seam of Clintwood coal in Wise County, Va. Winter temperatures here drop to zero, but Caterpillar's exclusive starting system gives positive results—keeps production high no matter what happens to the thermometer.

"In my estimation, Cat Engines are the best made. And we have exceptionally good dealer relations," says Gordon W. Gray, superintendent. The mechanic backs him up: "Caterpillar Engines are the easiest to maintain. They're the *only* equipment to use."

The D318 can save you money in low first cost, long and trouble-free work life, high trade-in value. Like all Caterpillar Engines, it gives full power, and idles without fouling, on low-cost No. 2 furnace oil. There are 12 Caterpillar Engines and Electric Sets, to 500 HP and 315 KW. Next time you repower, or order equipment from leading manufacturers of mining equipment, specify the Caterpillar unit that fits your needs. Your Caterpillar Dealer — who provides fast service and genuine parts — will help you pick the Cat power that's the right power for you.

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maker states. It employs a turbine-type blower, is designed for 24-hr sampling and has a sturdy cast-aluminum housing. Details from The Staplex Co., Brooklyn 32, N. Y.

(26) PLASTIC-PIPE CLAMP — Carlon Products Corp., Cleveland 5, offers a new re-usable molded plastic clamp to effect a tight, permanent leakproof seal when sections of flexible plastic pipe are connected by insert couplings, tees, ells and adapters. The new clamp, easily tightened with a strap wrench, now permits installation of completely plastic pipe lines and is produced in sizes for 16-, 1-, 116-, 2-, 3-, 4- and 6-in plastic pipe.

(27) FLEXIBLE COUPLING — Three sizes of Lovejoy Type C couplings adapted for use with Dodge Taper-Lock bushings now are available, permitting easy fastening to shafting with the firmness of a shrunk-on fit, with immediate delivery from distributors' stocks to accommodate various sized bores, the maker says. The Type C couplings offered are: C-191 (Dodge Bushing No. 2012) for bores ½ to 2 in; C-226 and C-276 (Dodge Bushing No. 2317) for ½ in bores. Details from Lovejoy Flexible Coupling Co., Chicago 44.

(28) NEW-TYPE WELDING ELECTRODE based on a principle said by the maker to be different than any other commercially available electrode, the Airoo "Easyare 12," is for welding mild steel at speeds double those with conventional electrodes. The greater speed is achieved through the addition to the electrode coating of a large amount of powdered metal which becomes part of the weld bead. The weld beads are exceptionally smooth and the weld metal is of high strength, good ductility and excellent X-Ray soundness, it is said. Bulletin ADC 650, with full details from Air Reduction Sales Co., New York 17.

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(29) WIRE-ROPE USERS are offered a new service plan developed by Broderick & Bascom Wire Rope Co., St. Louis, Mo., and administered by its more than 400 distributors. Under the Yellow Strand Speedi-Service plan, equipment users' wire-rope needs are determined by a distributor's survey or by facts supplied by the user and filed by the distributor on permanent record cards, one for each piece of equipment. When a rope requires replacement, the user advises his distributor of the machine and rope needed and the handy record file indicates in an instant the exact length, size, construction, grade, and lay of rope needed, so that the order may be immediately filled from stocks maintained for the user's needs. The plan is designed to save considerable time for the equipment owner, eliminating the time-consuming search for rope data and much record keeping.

YES-I would like more information . .

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Com	pany											

NOT GOOD if mailed after Apr. 1, 1954

(30) GROOVED-END VALVE—A new grooved-end version of its standard two-bolt yoke-type Nordstrom semi-steel lubricated plug valves has been introduced by Rockwell Mfg. Co., Pittsburgh 8, to make it possible to connect valves to steel pipe with grooved end couplings for a speedy, tight, permanent re-usable connection. The resulting flexible connection, with a deflection of several degrees at every joint permitting lines to follow the uneven ground contours, it is said, also offsets pipe vibration and overcomes the problem of pipe expansion and contraction. The new valve (Fig. 23144) is wrench-operated, has a pressure rating of 175 psi, WOG, and is produced in 2-, 2%-, 3-, and 4-in sizes.

(31) REFLECTOR LAMPS—New Westinghouse narrow- and wide-beam 300-watt reflector lamps with a PAR-56 bulb shape are rated for an average life of

2,000 hr, may be used at 115, 120, or 125 v and may be burned in any position. Featuring a powerful accurately controlled beam and freedom from fixture maintenance, they are designed for a wide range of applications in combination or singly in weather-protective equipment. Details from Westinghouse Electric, Lamp Div., Bloomfield, N. J.

(32) TWO NEW WELDING TORCHES now available include the Airco 400, 5% in long and weighing 6 oz, especially designed for light welding and brazing operations in various light fabrication and repair applications. The Airco Style 300 is a compact, lightweight torch designed primarily for oxyacetylene burning or welding of lead products, sheet, pipe and storage-battery parts, weighs 5 ox and is 2% in in length. Form ADC 721 with details from Air Reduction Sales Co., New York 17.

FREE BULLETINS AVAILABLE

(33) INDUSTRIAL PRODUCTS — New edition of Johns-Manville 40-p Industrial Products Catalog offers essential data on the following: insulations, refractory products, asbestos-cement pipe, packings, gaskets, electrical products, frictional materials, roofing, siding, flooring, partitions and ceilings. Photographs, diagrams and text have been revised and brought up-to-date to provide engineers and plant officials the latest information in a compact catalog easy to use. Available from Johns-Manville, New York 16.

(34) AMPLIDYNE SYSTEMS, how they operate, and where they can be used are described in a new 24-p booklet offered by the General Electric Co., Schenectady 5, N. Y. Designated as GEA-4053, the publication includes multi-color cross-sections, circuit diagrams, and charts; explains the electrical principles of "the short circuit that moves mountains" step-by-step; and describes various applications.

(35) STUD DRIVER - Bulletin 1401-2 details the design, operation and numer-

ous applications for the Velocity-Power Model "P" driver, a new-model portable powder-actuated tool for driving %- and %-in steel studs into steel, concrete or masonry, and for other work, listed and approved by Underwriters' Laboratories, Inc. Available from Velocity Tool Co., Pittsburgh 8, Pa.

(36) BELTING—New folder offered by Hamilton Rubber Mfg. Corp., Trenton 3, N. J., entitled "Belting for Industry," lists various types of rubber belting and what they are used for. It is designed to serve as a handy reference guide on belting constructions.

(37) STEEL CASTINGS — American Manganese Steel Div., American Brake Shoe Co., Chicago Heights, Ill., offers a new general catalog describing the complete line of castings made of "the toughest steel known." Included is a complete discussion of the impact—and abrasion-resistant characteristics of Amsco 13% manganese steel under each product category, with detailed information on power-shovel dippers, teeth, chain, gears,

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sheaves, crusher parts, dredge and materials-handling pumps, etc.

(38) FOWER SHOVELS—24-p bulletin published by the Thew Shovel Co., Lorain, Ohio, covers the crawler-mounted power shovels and cranes in the 1-yd Lorain "50" series. In addition, it details the Lorain "50" cranes, shovels, hoes, clamshells and draglines, the five interchangeable front ends, and accessory economent.

(39) WELDING SAFETY FILM—"The Cuy Behind Your Back," a new Air Reduction sound slide-film, is a fundamental approach to the factors affecting safety when operating oxyacetylene welding and cutting torches and cutting machines and is specifically designed for companies' training of employees. The story is presented in an amusing way by many cartoons and an easy-going narrative and was planned as a light approach to make the serious business of safety in welding easy to absorb. Free showings of this 20-min film may be arranged with the local Air Reduction office or with Air Reduction Sales Co., New York 17.

[40] RUBBER TRANSMISSION BELT-ING-36-p booklet offered by the B. F. Coodrich Co., Akron, Ohio, discusses construction features of various industrial belts. In addition, it provides detailed, step-by-step illustrated instructions on the method of making the Phylock belt joint, said by the company to eliminate the cause of nearly all transmission-belt failures.

(41) HOISTS—Bulletin CH describes the Coffing Challenger, a lightweight spur gear hoist of formed-steel construction that features easy portability and resistance to shock-load breakage. Hoist features, dimension drawings and specifications for the ½-, 1- and 2-ton models are included in the bulletin, from the Coffing Hoist Co., Danville, III.

(42) STORACE BATTERIES -- Pocketsized application guide on the Yardney "Silverce!" line of small lightweight rechargeable batteries is designed to facilitate cell-model selection. Offered by Yardney Electric Corp., New York 7, the guide has a rotating selector disk.

(43) FLEXIBLE TUBING — "Plexineering," the scientific application of flexible tubing for air, oil, steam, gases and volatiles, is explained in an 8-p data book offered by the Pennsylvania Flexible Metallic Tubing Co., Philadelphia 42. Applications, construction and engineering data are provided on the various Penflex products: steel, bronze, and aluminum tubing and hose in many types of construction; blower and ventilation hose; tar and asphalt hose; tank-car hose; diesel piping; marine unloading hose; electric conduit; rivet passers; and barrel fillers.

(44) CORRUCATED ALUMINUM ROOFING AND SIDING is described in a new booklet offered by the Aluminum Co. of America, Pittsburgh 19. Emphasizing the maintenance-free characteristics of aluminum as a building material, the 16-p booklet describes in detail, with comprehensive drawings, the easy and efficient methods of applying Alcoa corrugated industrial roofing and siding. Included are loading tables and weight and coverage tables, together with drawings presenting roofing and siding details on basic types of industrial structures.

(45) V-BELTS—Catalog on the new patented Veeles TD and TE adjustable V-belt for D and E belted drives is offered by the Manheim Mfg. & Belting Co., Manheim, Pa. Full installation and operating details are included on the new TD and TE Veelos which, the maker says, materially reduces installation and operation costs on hig drives.

(46) ELECTRICAL HEATERS — The 1954 edition of General Electric's catalog on Calrod electric heaters and industrial heating devices now is available from the company, Schenectady 5, N. Y. Designated as Bulletin GEC-1005E, the 60-p catalog describes the units in terms of application, special features, installation and pricing, and includes more than 175 photographs and drawings of the various products, including immersion, strip,

cartridge, tubular, insertion, and fin heaters, melting pots, thermostats, switches, and oven heaters.

(47) BEARING SELECTION is facilitated by the basic technical data in the new Catalog 61 describing Torrington heavy-duty needle bearings offered by the Torrington Co.'s Bantam Bearings Div., S. Bend 21, Ind. The catalog data cover design features, bearing selection, sealing, lubrication, speed and life factors, capacities, dimensions, typical to-stallations and recommended applications.

(48) DERRICKS, hoists, winches and other elevating and hoisting equipment in the Sasgen line specially designed for construction work are detailed and illustrated in new 16-p catalog. From Sasgen Derrick Co., Chicago 22.

(49) CRANES—Pocket-steed booklet, "All Lifts Are Easier With a CraneMobile," tells its story in conversation style and takes the reader around the specially designed carrier and into the crane cab to look over design, construction and operating characteristics of the Crane-Mobile, available in three types of mounting for all types of lifting and material-handling jobs. Offered by Bay City Shovels, Inc., Bay City, Mich.

(50) AIR VALVE—Bulletin 61861 describes in detail the recently introduced Pantex wobble-rod air valve by Pantex Manufacturing Corp., Pawtucket, R. I., aid to offer a new approach to on-off control with pneumatic systems, with unusual flexibility in automatic, semi-automatic and manual control of pneumatic circuits actuating various machinery and equipment. From Pantex Mfg. Corp., P. O. Bax 660, Pawtucket, R. I.

(51) SNOW REMOVER—"Melt," said by the maker to be a fast-acting ice- and snow-melting chemical in pellet form that will remove slippery ice and snow in seconds, is described in Bulletin L-8383, with prices, from the Chem Industrial Co., Brooklyn 9, Ohio.

(52) "POWER AND FLUIDS" is the title of a new magazine issued quarterly by the Worthington Corp., Harrison, N. J. Flanned to provide useful and authoritative information for readers in the power and fluid handling fields, it will describe new product applications, processes and methods, and cover installations, operation and maintenance of industrial apparatus and applications of particular interest because of specific problems involved. It will be furnished on request to those in the field, libraries, technical institutions, etc.

(53) PIPE COUPLINGS—Folder 102 on Morris compression pipe couplings explains their use on cast-fron, steel and asbestos-cement pipe, threaded or machanical joint, with prices, sizes and other specifications. From Morris Coupling & Clamp Co., Ellwood City, Pa.

(54) AIR COMPRESSORS — Booklet E describes Davey Super Chief 315-, 500- and 600-cfm models, in 4-wheel and skid-trailer mountings. From Davey Compressor Co., Kent, Ohio.

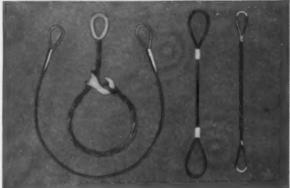


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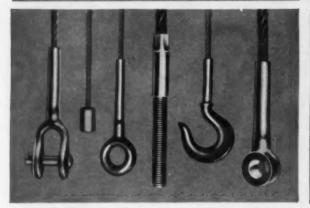


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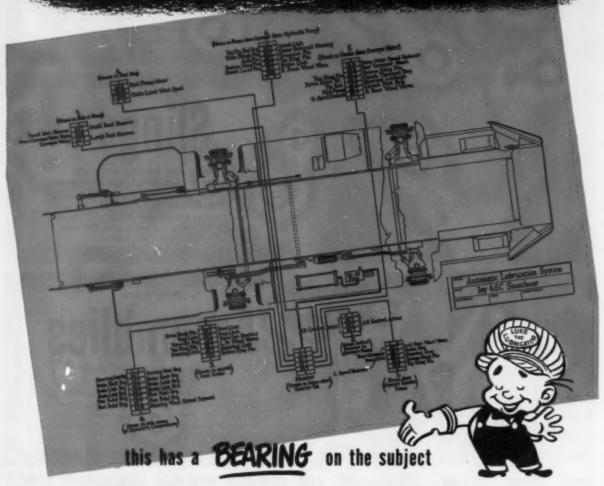


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News Round-Up

News Briefs and Trends

Bituminous Fund Reduces Aid to Disabled; Pensions Halved for Anthracite Miners

Trustees of the UMWA Welfare and Retirement Fund announced Jan. 20 that in March monthly maintenance benefits being paid to some 35,000 disabled bituminous miners and their families would be discontinued. The action was taken less for economy reasons than to put responsibility for their care up to federal and state relief programs where it belongs, the trustees reported. Elimination of the payments had no connection with the reduction in anthracite pensions and death benefits announced the day previously, it was pointed out.

The benefits discontinued by the bituminous fund are the \$30 monthly maintenance paid to disabled miners and the \$10 monthly paid to each of their dependents and similar payments to miners' widows and their dependents. Pensions to retired miners, health and hospital services, medical care to restore disabled miners and the \$1,000 death benefits to miners' widows are not affected. The aid eliminated totaled more than \$16 million during the fund's last fiscal year.

Pensions paid by the Anthracite Health and Welfare Fund to some 13,000 retired anthracite miners are being cut from \$100 to \$50 monthly, effective immediately, it was reported Jan. 19. Death benefits of \$1,000 have been reduced to \$500. The fund has been falling behind in its payments because of the decline in anthracite production, with the resulting decrease in income from the

50c-per-ton royalty. It owes the union some \$4 million, according to reports. The current curtailment is not the first reduction in the fund's benefits. Payments of \$30 to \$40 monthly to families of disabled miners were discontinued in January, 1950. Pensions also were suspended for a period in 1949 but were later made up.

later made up.

Halving of the anthracite pensions brought an immediate reaction in the region. Clenn O. Kidd, president of the Lehigh Coal & Navigation Co., charged that some competitors are withholding more than \$1½ million from the fund and are using it to undercut prices so that "a ruinously competitive situation in the industry" has resulted. "Legitimate" companies are reaching the point where they cannot survive and "we are not going to tolerate it," he said.

In reply, Thomas Kennedy, UMWA vice president, called Mr. Kidd's statements "irresponsible and distorted." Maintaining that bootleg production was at a minimum, Mr. Kennedy also said that companies delinquent in the payments to the fund "are confined to a relatively few concerns and the situation affecting those few companies has improved within recent months. The problem is important to all and we are attacking it on all fronts." When questioned by the press, Harry J. Connolly, president of the Pennsylvania Coal Co. and operator trustee for the fund, said that "Mr. Kidd probably knows what he

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is talking about." The total owed was "sizeable" but he could not say the exact amount, Mr. Connolly reported.

UMWA Ends 15-Mo Drive Against Elk River Coal & Lumber Co.

The 15-mo organizing campaign at the Widen mine of the Elk River Coal & Lumber Co., Widen, W. Va., was abandoned as "a lost cause" Dec. 28 when the withdrawal of pickets was jointly announced by William Blizzard, presi-dent, UMWA District 17, and Darrell Douglas, one of the strike leaders. "We called it off ourselves," said Mr. Douglas, explaining that "our men were tired of staying on the picket line and morale was low among the pickets." In confirming the announcement, Mr. Blizzard said: "Perhaps there'll be another time. The strike originally started Sept. 20, 1952, when some of the 600 members of the independent union walked off the job reportedly because of grievances. The mine continued to operate as over half the workers stayed on the job and the dissident group affiliated with the UMWA. The drive was marked by violence on various occasions, including the dynamiting of the company's rail-(Continued on p 166.)



Anthracite Exhibits New Commercial Units

NEW DESIGNS and improved models of automatic anthracite burning equipment for commercial and small industrial use went on display to architects, builders and real-estate interests Jan. 20 in the Architects' Bldg., New York City, following attendance at a preview Jan. 20 by over 125 representatives of home and "shelter" magazines, newspapers, and business publications serving the coal, heating, building and home-furnishing industries.

Equipment on display, like the Losch automatic conversion burner in the accompanying photograph, included complete boiler and automatic firing units with capacity from 100 to 400 lb per hour, designed especially for public buildings, schools, apartment buildings, institutions and small factories and plants. Several of the new types already have been put on the market in limited areas. Initial prices are lower than those of units burning competitive fuels and maintenance costs are less, exhibitors pointed out.

Island Creek Marks 50th Anniversary in 1954; **Looks to Future Industry Opportunities**

AN ENCOURAGING OUTLOOK toward the opportunities that lie ahead for the coal industry and for his company in particular is expressed by R. E. Salvati, president, Island Creek Coal Co., in a "Pledge to the Future" to be issued as a part of Island Creek's celebration of its 50th anniversary in 1954.

In 1904, Albert F. Holden and William H. Coolidge, both corporate officers of the United States Oil Co., which later became the Island Creek Coal Co., acquired 28,000 acres of coal land in the rugged areas of Logan County in southern West Virginia. The town of Holden was founded as the center of operations. Machinery and other necessities were hauled in by ox team even before rail facilities were extended to Holden. In December, 1904, railroad service was initiated and the company sold and shipped the first of the more than 273 million tons it was to sell in the ensuing 50 yr in southern West Virginia and eastern Kentucky.

Some 20 yr after this first shipment of Island Creek coal, another important coal producer, the Pond Creek Pocahontas Co., began operations in Mc-Dowell County, West Virginia. Like the Island Creek Coal Co., it, too, assigned the marketing of its output to Island Creek Coal Sales Co. and its agents. Today the coals produced by both these companies are marketed as Island Creek products, by which name they are well known throughout the coal markets of the world.

For its Golden Anniversary, Island Creek is preparing for distribution in March a 44-p brochure describing pictorially all phases of modern coal production and marketing. In the "Pledge to the Future" appearing in this booklet, Mr. Salvati says in part:

Island Creek has come a long way in the 50 yr since its founders with their ox teams moved mining equipment into what was then a wild, mountainous section of West Virginia. It has had a steady, healthy growth because throughout these years Island Creek men and women have been inspired and well schooled in the basic principles of quality and service so well established by the founders. Over the years, over 273 million tons of Island Creek products have met these market tests. Present reserve tonnage exceeds that already produced and yearly capacity exceeds 10 million tons.

"Our interest, our obligations and our confidence in the future are predicated upon knowledge and appreciation of the past. That coal has always been America's basic resource is an established fact. We are confident that it will remain so in the future. As a segment of this essential industry, we acknowledge and accept our responsibility to serve the future with the same sincerity of effort, diligence of purpose and strength of character that we and those before us have endeavored to manifest in the past.

We expect to devote more and more time to research in developing new ways of putting coal to work, in creating new equipment to burn it with greater convenience and efficiency, in finding new ways for using it in other forms and in developing new methods for producing and distributing it at lower costs. It is our intention to continue our policy of fostering and supporting industry activities having as their purposes the betterment of our business and services to the coal-consuming public.



OUTLOOK ENCOURAGING - R. E. Salvati, pres., Island Creek Coal Co.

"The nation's over-all energy load is conservatively expected to double within the next 25 yr. Coal will supply the greater part of this energy. Despite technological and scientific developments, we are certain that in the years ahead coal will be the cheapest of all energy sources. Fuels competitive to coal are becoming increasingly expensive to discover, transport and produce, while coal, on the other hand, is being benefited by newer and better methods of mining, plus technological advancement in economy of use.

We acknowledge the certainty that the future will reveal much that is today unknown. To this end it is our purpose to maintain at all times adequate productive capacities, to provide well-trained service departments and to keep abreast of all technological progress so that the needs of our valued customers may be satisfied in all respects at all times.



LEFT PHOTO: C. G. Evans (left) and V. R. Rogers, recently named personnel manager and chief electrical engineer, respectively, North American Coal Corp. Mr. Evans formerly was general superintendent, Red Parrot Coal Co., and Mr. Rogers superintendent of its Red Cedar mine.



COAL MEN ON THE JOB . . . North American Coal Corp. and subsidiaries

RIGHT PHOTO: Night officials at No. 5 mine, Red Parrot Coal Co., Prenter, W. Va.: Seated-Carl E. Morgan (left), former general mine foreman, recently transferred to C. H. Mead Coal Co. as inside foreman; Pat Bratcher, Henry Keefer and Cecil Kefer, section foremen. Standing-Bill Sharpe (left), section foreman; Cecil Keeney, transportation foreman; T. R. Miller, former general night foreman, recently promoted to gen. mine foreman; Andy Wiley, prod. foreman; Percy Burgess, sect. foreman.

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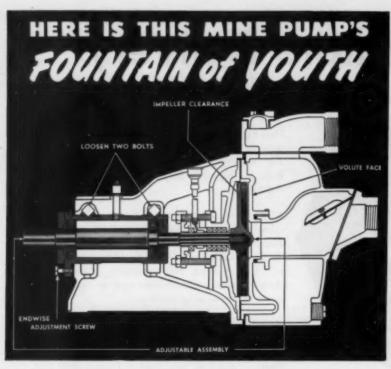
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Guyan Machinery Co., Lagan, W. Va.

Hoe Supply Co., Christopher, Illineis Industrial Supply Co., Terre Haute, Indiana Jackson Implement Co., Jackson, Ohio Johns Equipment Co., Jackson, Ohio Johns Equipment Co., Ft. Wayne, Indiana McComb Supply Co., Harlan, Ky. Mine Service Co., Letheir, Ky. Reliable Electric & Equip. Co., Zenesville Ohio Superior Sterling Co., Bluefield, W. Va. Tennessee Mill & Mine Supply Co., Knoxville, Tenn. Wast Virginia Pump & Supply Co., Huntington, W. Va.



GORMAN-RUPP COMPANY

305 BOWMAN STREET, MANSFIELD, OHIO



Price Retires From Inland Steel Post

EDWIN R. PRICE, manager, coal properties, Inland Steel Co., Wheelwright, Ky., since 1930, retired at the end of January. Mr. Price, operator member of the three-man Federal Coal Mine Safety Board of Review, has become widely known as an industrialist and leader during his 48-yr career in the coal industry. Starting his coal mining eareer in 1906 as a laborer at the Somerset, Pa., mines of Consolidation Coal Co., he moved up through the engineering department into mine management and, in 1917, was named manager of Consolidation's mines at Van Lear, Ky. In 1928 he moved to Wheelwright as manager of mines for the Elk Horn Coal Corp., and was retained in that position when Inland Steel Co. bought the properties in 1930. Mr. Price has been active in many Kentucky state and regional organizations and is a past chairman of the AIME Coal Div. Upon his retirement, Mr. and Mrs. Price moved to their new home at 216 Rockwell Terrace, Frederick, Md.

King Named Chief of West Viginia Mines Department

The appointment of Frank B. King as chief of the West Virgina Department of Mines to succeed Joseph Bierer, who resigned Dec. 14, was announced Dec. 28 by Gov. Marland. Mr. King, who had been administrative assistant to Mr. Bierer since last April, was an official of the Valley Camp Coal Co. before joining the department in 1949 and has had some 20-yr of experience in mining, starting in as a coal loader. Mr. Bierer, who had been with the department since 1903 and its chief since May, 1952, submitted what he called a "courtesy resignation, stating that his term expired at the end of the year and he had reason to believe that Cov. Marland would not re-appoint him.

1

MCarthy SELF-MOVING DRILL HEAVY - RUGGED - POWERFUL



McCarthy barrel type cutting head produces maximum quality and quantity of lump coal.

Mining Low-Cost Quality Coal ...

This hydraulically self-moving 42" McCarthy Coal Recovery Drill is mining up to 500 tons of clean, low-cost, quality coal per day at Hodgeville, West Virginia. It has a three-man crew — operates in pits as narrow as 34 feet. Operator has all-around clear vision, including highwall. Jacks, hydraulically operated, lift 48 inches. Model 12 is built to handle augers 24 feet long from 16 inches to 48 inches in diameter as specified. Other McCarthy Coal Recovery Drills use augers 4, 6 and 12 feet in length.

THE SALEM TOOL COMPANY

763 SOUTH ELLSWORTH AVE. •

SALEM, OHIO, U. S. A.



Harman-Feds Creek Honors Foreman for Safe Records





ACCIDENT-FREE-CREW SUPERVISORS—A. V. Sturgill (left), Harman section foreman, awarded a trophy cup and safety lamp for his 4-yr record; Auta Branham, Harman, 2 yr; Neil Whitt, Harman, 2 yr; and McKinley Lester, Feds Creek, 2 yr. Others not in photo were Frazier Fletcher, Harman, 2 yr; Joe Lester, Feds Creek, 2 yr; and Corbett Belcher, Feds Creek, 3 yr.



ONE-YEAR HONOR ROLL—Seated: Joe Niday (left), Harman; Reed S. Deel, Feds Creek; Earl Fields and Fred Rigsby, Harman. Standing: Giger Carter (left), mine foreman, Feds Creek; Theodore Ratcliff and Jonah Williamson, Feds Creek; Clyde Cooy and C. D. Sturgill, Harman. Absent from photo: Bill Belcher, C. B. Clevenger and Elmo Pardieu, Harman; Ed O'Bryan and Lawrence Hamilton, Feds Creek.



HARMAN-FEDS CREEK OFFICIALS AND VISITORS—Seated: E. N. Norris Jr. (left), comptroller; I. J. Richardson, president; M. T. Farmer, purchasing agent; C. R. Coombs, claims adjuster, Underwriters' Safety & Claims; Robt. M. Jewell, Virginia district inspector; and Paul H. Schindler, general manager, Underwriters' Safety & Claims. Standing: Ralph Asbury, claims adjuster; Elbert Asbury, safety director; T. G. Osborne, assistant general superintendent; R. V. Venable, general superintendent; H. C. Brumbaugh, federal mine inspector; J. H. Mosgrove, safety director, Big Sandy-Elkhorn Coal Operators' Association; W. R. Campbell, Underwriters' safety director; and Paul H. Lu, mining engineer, Talwan Prov. Dept. of Reconstruction, Taipei, Formosa, China.

TOP COMPANY HONORS, for 4 yr of accident-free supervision, went to A. V. Sturgill, section foreman, H. E. Harman Coal Corp., Harman, Buchanan County, Va., at a luncheon meeting held for officials of the company and the affiliated Feds Creek Coal Co., Big Creek, Pike County, Ky.

County, Ky.

I. J. Richardson, president of the two companies, presented trophy cups to Mr. Sturgill and to other foremen cited for supervising accident-free crews for periods of 1 to 3 yr, as well as screw-driver sets to all attending the meeting.

Paul H. Schindler, Louisville, Ky., general manager, Underwriters' Safety & Claims Co., which represents Lloyds of London and Seaboard Surety Co., presented a flame safety lamp to Mr. Sturgill, pen and pencil sets to the 1-yr men, wallets to the 2-yr men and lighters to the 3-yr men.

Accident statistics and analyses for the two mines for the insurance year through August, 1953, were distributed by W. R. Campbell, safety director, Underwriters' Safety & Claims, who discussed the showings. During that period, the Harman mine produced 719,870 tons, at a rate of 21,619 tons per accident; the Feds Creek mine, 592,263 tons at a rate of 19,105 tons per accident.

Other speakers at the meeting included: C. P. Kelly, chief inspector, Virginia Division of Mines; R. V. Venable, general superintendent; Ted Osborne, assistant general superintendent; E. B. Sturgill, Harman general mine foreman; M. T. Farmer, purchasing agent; Elbert Asbury, safety director; Millard Carroll, mine superintendent, Feds Creek; John Steele, general mine foreman, Feds Creek; and J. H. Edwards, associate Editor, Coal Age.

Pennsylvania Safety Unit To Fight Roof-Fall Accidents

Creation of a safety organization within the present inspection force of the Pennsylvania Department of Mines to wage an all-out campaign for the prevention of accidents from roof falls and the appointment of W. R. Cunningham, Johnstown, 7th District inspector, to head the unit, were announced last month by W. J. Clements, Secretary of Mines. Earlier, in a letter to the industry Dec. 22, Mr. Clements had pointed out that 70% of all fatalities inside Pennsylvania coal mines during 1953 to that date had been caused by falls of roof and said that duties of the new organization would be to study causes and fix responsibility for such accidents, recommend preventive measures and report directly to his office. "To permit this needless loss of life to continue would be to the discredit of the coal industry and to those who are responsible for the safety of mine workers," Mr. Clements said. To head up the organization in the anthracite region, Mr. Clements named Andrew Wilson, Pittston, in-spector for the 7th Anthracite District for 7 yr.



with a coal that's exactly right

Name your choice—in "Bituminousland" along the Baltimore & Ohio, we have it! Here Nature has stored a supply of economical heat and energy sufficient to last for centuries.

B&O Bituminous coals exist in wide variety. The mines that produce them are thoroughly mechanized so that costs are kept low, size and quality uniform. Nearness to industrial centers results in low transportation costs, and the ease of storing removes the need for expensive facilities. Furthermore, new methods and equipment have increased the burning value of Bituminous.

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BALTIMORE & OHIO RAILROAD

Constantly doing things-better!



Government Policy Outlined On Synthetic-Fuels Research

The future policy for the Bureau of Mines synthetic-liquid-fuels program, which will emphasize fundamental laboratory and pilot-plant research on producing liquid fuels from coal and oil shale, was outlined Jan. 13 by Secretary of the Interior Douglas McKay. He also announced that he had approved the recommendation of Felix E. Wormser, Assistant Secretary of the Interior for Mineral Resources, and J. J. Forbes, director of the Bureau of Mines, not to request extension of the Synthetic Liquid Fuels Act, due to expire in April, 1955.

The Bureau's organic legislation, under which research was formerly conducted, appears to contain ample authorization for the studies contemplated, and while special legislation was needed in 1944 to provide more complete authorization for an extensive construction program, including the acquisition of land, this need does not presently exist, it was pointed out. In lending active support to fundamental work in laboratory and pilot-plant operations, the Department of Interior will continue to cooperate with private industry through cooperative projects and frequent technical discussions and will encourage private industry to assume primary responsibility as soon as any

ARMSTRONG-BRAY

GEAR and WHEEL

project reaches an advanced developmental stage, Mr. McKay said.

The specific procedures outlined by the Secretary include:

Coal-to-oil research program: (1) work to be continued on direct hydrogenation of coal and on the synthesis of liquid fuels from gasified coal within the Bureau's laboratory facilities; (2) pilot plants to be confined to small-scale facilities of the type needed to supplement laboratory work.

Coal-gasification program: laboratory research and pilot-plant runs to be con-

tinued.

Oil-shale programs: (1) no further large-scale mining development to be undertaken, the oil-shale mine at Rifle, Colo., to be operated primarily to supply material for the 'retorts, and development of a new mining procedure on paper authorized for the current fiscal year; (2) laboratory research on oil shale to be continued; (3) retorting of oil shale at Rifle to continue until the practicability of the Bureau's new retorting equipment has been reasonably demonstrated, but large-scale shale-oil refining work to be discontinued.

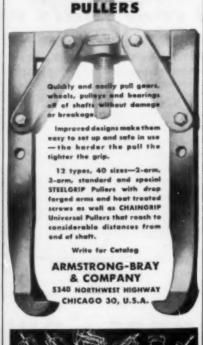
The plans outlined are in keeping with the earlier decision to discontinue the operation of demonstration plants and to confine research and development programs to those industry cannot be expected to undertake at this time. In addition they follow the historic Bureau of Mines policy of dropping research and development projects as soon as they have reached an industrially com-

petitive status, it was said.

In the future coal-to-oil research program, work at Bruceton, Pa., will cover the direct hydrogenation of coal and the synthesis of liquid fuels from gasified coal, while the work at Morgantown, W. Va., will be devoted to coal gasification with laboratory research and pilot-plant operations. Laboratory research and pilot-plant development work on oil shale and shale oil will continue at Laramie, Wyo., and at Rifle.

Work on the underground gasification of coal was discontinued in June, 1953, after the third experiment, because it was felt that a full-scale operation was needed and that, in view of the desire to reduce the budget, it should not be undertaken at this time. The coal-to-oil demonstration facilities at Louisiana, Mo., have been returned to the Army, from which they were obtained in 1944, for disposal.

NEWS of your company, personnel changes and other activities, are interesting to other Coal Age readers, so why not be sure to tell us about them. Write The Editor, Coal Age, 330 W. 42 St., New York 36, N. Y.





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to you
in March
Coal Age

A PERMANENT REFERENCE GUIDE-BOOK for planning new preparation plants, plant additions or changes in present plants.

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THE Coal Age PREPARATION GUIDEBOOK

Today, more than 50 percent of bituminous coal production is mechanically cleaned in 650 preparation plants. Five years ago, only 30.2 percent was cleaned in 502 plants.

This pronounced increase is due to the demand for better coal quality to meet the competition of other fuels and the competition of individual firms within the industry. Modern, efficient, low-cost preparation may mean the difference between showing a profit and going out of business. That's why every coal operating official should be interested in coal preparation. That's why COAL AGE is presenting "The COAL AGE Preparation Guide Book" in the March issue. To give you the fundamental facts - in one place - as a guide for planning new preparation plants. plant additions or changes

COAL COMPANIES PROFIT

CASE HISTORIES,

1. Consolidation Coal Co. (W. Va.), Fairmont, W. Va.

"In these days of high freight rates and expensive handling, many industrial coal consumers are successfully meeting the challenge of fuel costs through the savings and increased efficiency that come from well-prepared high-Btu bituminous coal. To increase our ability to meet this need, we have built the most modern coal-mining and preparation facility in the Fairmont region. Williams mine has the largest production potential and the longest life expectancy of any Pittsburgh-seam operation in northern West Virginia." — George R. Higinbotham, President, Consolidation Coal Co. (W. Va.), Fairmont, W. Va.

The preparation plant is the latest in a series of improvements and new developments initiated immediately after its formation by the Pittsburgh Consolidation Coal Co. Its completion represents the \$91 million point in Pittsburgh Consol capital expenditures since 1946. The company, throughout its five divisions, now has 17 new or improved preparation plants. These serve 25 modernized mining operations, or all the long-life properties producing coal for commercial markets.

It was designed and built by the Fairmont Machinery Co. "Firsts" and unusual features include the following:

- Unlike any other Pittsburgh-seam operation in the Fairmont region, two distinct types of wet-washing equipment are employed.
- Thermal drying is used for the fine sizes, in addition to centrifugal drying and normal dewatering screens
- Liberal extra space has been provided and the design tailored to permit rapid expansion of preparation capacity by the addition of another Chance cone, additional Deister SuperDuty Diagonal-Deck tables, and additional centrifuges and thermal-drying equipment.
- 4. Enclosed modern design has resulted in employees christening the plant the "Williams Windowless Wonder." Construction is steel and concrete, and the plant occupies slightly over an acre, with the equivalent of 3 acres in its eight operating levels extending up to 100 ft. above ground level.
- Special features include a vacuum dust-collection and ventilating system, fluorescent lighting, elevator serving all operating levels and a loud-speaker system.

2. Pocahontas Fuel Co., Inc., Itmann, W. Va.

Adding a potential output of 2,000,000 tons per year to the productive capacity for the "Original Pocahontas" coal produced by Pocahontas Fuel Co., Inc., now rated at 7,000,000 tons annually, the new 760-tph Itmann plant, at Itmann, W. Va., was timed to take advantage of the new developments that have come along in coal preparation. Plant design was deferred until these new developments could be proved by experience, which pro-

in present plants.

BY INSTALLING MODERN PLANTS AND EQUIPMENT

AS REPORTED BY COAL AGE IN 1953

vided an opportunity for building a plant modern in all respects and specifically equipped to provide the maximum in quality and uniformity.

The new Itmann plant began service Feb. 12, 1951, and features, among other new developments, picking out rock and breaking lump to 7 in., pre-drying and aircleaning 3/16x0 and washing 7x3/16 in heavy-media equipment.

3. Red Jacket Coal Corp., Red Jacket, W. Va.

To produce the best coal possible — a real premium coal — was the objective of officials of the Red Jacket Coal Corp., Red Jacket, W. Va., in planning the new No. 17 preparation plant in consultation with engineers of the Roberts & Schaefer Co., which handled the design details, fabrication and erection.

With the main section of the 350-tph plant in operation since last May, that goal has been achieved for sizes above 3/16 in. and the resulting premium products are being marketed as "Southern Belle Coal." Completion of a pre-drying and air-cleaning addition to be built soon will upgrade the 3/16x0 carbon from a medium to good-quality steam coal to a premium by-product coal. Working two continuous seams simultaneously, this newest Red Jacket operation will supply 25 to 27 million tons to the new plant.

4. Black Star Coal Corp., Alva, Ky.

What can a modern preparation plant do for an operation?

Increased running time in a rather static domestic market and a growth in production that makes its property one of the four largest in Harlan County are among the benefits derived from the new plant of the Black Star Coal Corp., Alva, Ky. Designed primarily for making premium stoker coal, the new washing plant is handling 250 tph of 5x0-in. coal, with a reject of 10%.

Utilizing an air-operated jig and centrifugal and flash driers, the Black Star plant cut the ash in its stoker coal from the previous 7 to 8% down to 2½ to 3%, and has reduced the ash in the carbon from 12 to 13% formerly to 6 to 7%. Among other features is a horizontal centrifugal filter installed to clarify and conserve water.

Mechanical loading in the Black Star mines began on an extensive scale in 1946 with installation of Joy 14 BU loaders and Joy 32-E shuttle cars. About that time, or shortly afterwards, dirtier coal was encountered in the workings. Considering everything, a cleaning plant loomed as a necessity — to permit complete mechanization, place the coal in better markets and provide better running time.

The new washing and drying plant that resulted was located in a separate steel building adjacent to the existing steel tipple, which has extensive screening, crushing and mixing facilities. The new plant, designed and built by the McNally-Pittsburg Mfg. Corp., went into operation in April, 1950. The improvement has enabled the

Black Star operation to become one of the four largest producing mines in Harlan County. Including Black Star, four mines in the county now are equipped with mechanical-cleaning plants.

5. Dawson Daylight Coal Co., Dawson Springs, Ky.

Recovering ½ x0 coal formerly partially wasted, stepping up screening performance, and reducing the number of screen changes are top benefits derived from three heated-screen vibrator units installed at the New Daylight preparation plant of the Dawson Daylight Coal Co., Dawson Springs, Ky.

6. Beaver Brook Coal Co., McAdoo, Pa.

Dual-gravity separation of sizes from stove through buckwheat in a single vessel is one of the latest developments in anthracite preparation practice. Proud owners of the new installation, Beaver Brook Coal Co., Mc-Adoo, Pa., report that their Wemco Mobil-Mill with a two-compartment drum separator rated at 100 tph, is satisfactorily converting feed from deep strippings or banks into three fractions: (1) clean Lehigh anthracite, (2) stripped-clean refuse and (3) a middlings product which is crushed and recirculated through the drum of the Mobil-Mill to insure highest possible yield from the feed.

Furthermore, the new plant at the company's Redco colliery features a medium-reclamation system which is equipped with only a single densifier. Thus, the two-compartment drum contributes to more economical operation in three important ways: fewer pieces of equipment are needed, construction and installation costs are lower and a minimum of floor space is required.

7. Lehigh Navigation Coal Co., Lansford, Pa.

New auxiliary unit at Coaldale cleaning plant is equipped with a 2-car rotary dump to permit one car of rock to be dumped while another is cleaned inside by a highpressure water spray. The benefits are increased car capacity and lower overtime labor costs.

8. Reidinger Coal Service, Paxinos, Pa.

All cleaning plants are not big ones. There's a small-business side to the industry, too. One of the better examples in anthracite is the Reidinger Coal Service plant at Paxinos, Pa. Operated by Victor Reidinger, a 24-yr. veteran in coal, the plant cleans and sizes deep-mined Lykensvein coal purchased from several independent operators in the Paxinos area. The major cleaning units are a Wilmot Simplex Type D jig for stove and nut sizes and a pair of 2-ft. Menzies cones for the smaller sizes.

In business for himself since 1946, when he purchased an old plant and the site on Route 122 between Shamokin and Sunbury, Mr. Reidinger points out there always is some improvement you can make. Since 1946, the plant has been substantially rebuilt. Now he looks forward to the addition of another cone to help clean pea and buckwheat and thus ease the load.

SOME OF THE COAL COMPANIES WHO HAVE CONTRACTED FOR MODERN PREPARATION PLANTS OR EQUIPMENT IN 1953* (January-October)

As reported to COAL AGE by preparation plant designers and equipment manufacturers

Pocahontas Fuel Co., Inc., Mine #31, Amonate, Va. Imperial Coal Corp., Cambria mine, Coalport, Pa.

Ebensburg Coal Co., Colver mine,

Colver, Pa.

Page Coal & Coke Co., Pageton, W. Va.

Stonega Coke & Coal Co., Appalachia, Va.
Lynnville Coal Co., Buckskin, Ind.

Mathies Coal Co., Mathies mine,
Courtney, Pa.

Rochester & Pittsburgh Coal Co., Ernest mine, Ernest, Pa.

Reidinger Coal Co., Paxinos, Pa. D & Z Coal Co., Shamokin, Pa. Truax-Traer Coal Co., Velva, N. D. Harmar Coal Co., Harmarville, Pa.

United States Steel Corp., Alpheus plant, Gary, W. Va.
Kentucky Fuel Co., Hellier, Ky.

Stoudt's Ferry Preparation, Leesport, Pa. Rochester & Pittsburgh Coal Co.,

O'Donnell mine, Four States, W. Va. Rochester & Pittsburgh Coal Co., Kent #1-2 mine, McIntyre, Pa.

Compass Coal Co., Elk Creek mine, Philippi, W. Va.

Consolidation Coal Co. (W. Va.), #32 mine, Owings, W. Va.

Pennsylvania Water & Power Co., Safe Harbor, Pa.

Oglebay, Norton & Co., O.K. Coal, Inc., N. Industry, Ohio W. P. Stahlman Co., Corsica, Pa.

Wynn Coal & Coke Co., Fairchance, Pa. Crescent Coal Co., Central City, Ky. Jenkins Coal Mining Co., Earlington, Ky. Joanne Coal Co., Rachel, W. Va. Denise Coal Co., Somerset, Pa.

Clearfield Bituminous Coal Corp., Indiana, Pa.

Roslyn Cascade Coal Co., Ronald, Wash. Ozark Philpott Mine, Ozark, Ark.

Nugent Mining Co., Luthersburg, Pa. David Z. Norton Co., #3 mine, Powhatan, Ohio

Penag Coal Co., Good Springs, Pa. Schneck Coal Co., Suedburg, Pa. Republic Steel Corn., Snaulding mine

Republic Steel Corp., Spaulding mines, Spaulding, Ala. Jewell Ridge Coal Corp., Blair Fork

mine, Delphia, Ky. Johnstown Coal & Coke Co., Logan #3

mine, Beaverdale, Pa.
United Electric Coal Cos., Chicago, Ill.
Valley Camp Coal Co., Alexander mine,
Elm Grove, W. Va.

Sycamore Coal Co., Cinderella, W. Va.Alabama Power Co., Barry Steam Plant, Mobile, Ala.United States Steel Co., Robena mine,

Greene County, Pa. Swatara Coal Co., Minersville, Pa. Diminick Coal Co., Paxinos, Pa. State of Tennessee, Petros, Tenn.

South Union Coal Co., #11 mine, Edna, W. Va.

C. M. Bixler, Valley View, Pa.
 Atkins Coal Co., Frackville, Pa.
 Bell & Zoller Coal & Mining Co.,
 Johnson City, Ill.

Altmire Bros. Coal Co., Inc., Apolla, Pa. William Aloe Coal Co., Imperial, Pa. Pine Creek Coal Co., Spring Glen, Pa. Milburn By-Products Co., Milburn, W. Va.

West Virginia Coal & Coke Corp., Dorrance Colliery, Omar, W. Va. Seminole Coal Corp., Lenzburg, Ill. Harlan Fuel Co., Yancey, Ky.

Oglebay, Norton & Co., Richwood-Sewell
Coal Co., Burton mine, Allingdale, W. Va.

Peabody Coal Co., Harco, Ill.
Rochester & Pittsburgh Coal Co.,
Lucerne mines, Pa.

Clinchfield Coal Corp., #9 mine, Clinchco, Va.

Crucible Steel Co. of America, Crucible, Pa. Lion Coal Co., Wattis, Utah Banner Fuel Corp., Toms Creek, Va. Gilberton Coal Co., Gilberton, Pa. Kentucky Fuel Co., Hellier, Pike Co., Ky. Russell Fork Coal Co., Mikegrady, Ky. North Branch Coal Corp., Kitzmiller, Md. Jacob's Fork Pocahontas Coal Co.,

Squire, W. Va.
Tasa Coal Co., #8 mine, Zelienople, Pa.
Glen Alden Coal Co., Woodward Colliery,
Kingston, Pa.

Blue Diamond Coal Co., Leatherwood #2 mine, Tilford, Ky.

Eastern Gas & Fuel Associates, Wharton #2 mine, Wharton, W. Va.

Pocahontas Fuel Co., Inc., Bishop #33-34 mine, Bishop, Va.

Centralia Mining Co., Centralia, Pa. Bridgeview Coal Co., Fayette Co., Pa. Mahan-Ellison Coal Corp., Lancing, Tenn. Alabama By-Products Corp., Maxine mine, Maxine, Jefferson Co., Ala.

Maxine, Jefferson Co., Ala. Lockhard Coal Sales, Shamokin, Pa. Cain Coal Sales, Shamokin, Pa. Armco Steel Corp., Nell.s, W. Va. Valley Camp Coal Co., #8 mine, Shrewsbury, W. Va.

*This is an exclusive COAL AGE monthly feature.



Southern Producers' Name Safety Director

J. B. Benson (above), chief of the Norton (Va.) branch of the USBM and a widely known expert on coal-mine safety, last month was appointed to the newly created post of safety director for the Southern Coal Producers' Association. The new position is intended to coordinate safety activities of the association's members, the federal and state bureaus and the UMWA, said Joseph E. Moody, association president, in making the announcement.

"An effective safety program, both from a human and economic standpoint, has always been a major objective of the mines in our association," Mr. Moody declared. "I am happy that we are now able to move even further in this field with the appointment of a full-time safety engineer to work with all members and others concerned in this vitally important work."

Mr. Benson, who will make his headquarters in the organization's Washington office, began work at the age of 14 in the coal mines of Ohio. Following his graduation from the Cooperative Dept., Mining Engineering, Carnegie Institute of Technology, he served as engineer and then chief engineer for the Pursglove Coal Mining Co. He held official posts with Consolidation Coal Co. (Ky.) and the Bethlehem Mines Corp., served as director of safety for the Koppers Coal Co. and later was assistant general superintendent for the Marianna Smokeless Coal Co. He joined the USBM in 1942 as senior mining engineer in the Birmingham, Ala., office and had been chief of the Norton branch since 1950. Mr. Benson also holds a Bachelor of Laws degree from the Birmingham School of Law.

"Mining doesn't necessarily have to be dangerous," commented Mr. Benson in pointing to the great deal of progress being made by the various training programs sponsored by the Bureau, state safety authorities and individual companies. "It will be my aim to coordinate these training activities in our association mines, as well as to work with management and the union in expanding them," Mr. Benson said.



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The Model 12-B Coal Drill gives you sale, dependable fast drilling with complete operational salety... ne spark, no kick... all electrical hazards are removed yards from the drill. Powered from the hydraulic power systems of standard mining equipment, the Model 12-B is simple in design. It has a minimum of operating parts resulting in greatly reduced maintenance costs.

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EXPRESS 1-1571

Personal Notes

Red Jacket Coal Corp., Red Jacket, W. Va., has announced a number of changes in its personnel. O. L. Craven has been promoted to assistant superintendent, Coal Mountain mines, Coal Mountain, W. Va. John F. Maurice, after many years of service, has retired as chief engineer of the company. He is succeeded by C. H. Williams, formerly assistant chief engineer. Norman W. Long, resident engineer, has been named to succeed Mr. Williams. D. T. Posten has been transferred from resident engineer, Wyoming County mines, to resident engineer, Mingo County mines, and C. L. Glover has been named to succeed Mr. Posten. A. F. Cook has retired as superintendent, Mingo County mines, after 32 yr of service with Red Jacket. G. F. Davis, assistant superintendent, Junior mine, has been advanced to succeed Mr. Cook. Lewis Simpkins, general mine foreman, has been promoted to assistant superintendent, Junior mine, succeeding Mr. Davis, and A. A. Mankin succeeds Mr. Simpkins.

Consolidation Coal Co. (Ky.), Div. of Pittsburgh Consolidation Coal Co., Jenkins, Ky., has appointed David A. Zegeer assistant to the president. Joining the company in 1946, Mr. Zegeer held various positions with the company, including mining engineer, section foreman, assistant superintendent and project engineer, before his recent appointment.

Inland Steel Co., Wheelwright, Ky., has announced the appointment of Paul C. Linkous as supervisor of employment and

COAL MEN ON THE JOB . . .





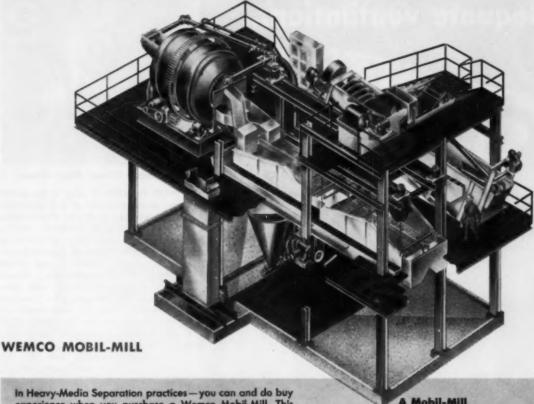
RUSSELL FORK COAL CO., INC., Praise, Pike County, Ky.: E. T. Queen (left), superintendent; Homer Stone, belt mechanic and welder; and Otis Elswick, chief electrician. Messrs. Stone and Elswick are credited with development of the money-saving "Operating Ideas" described on pp 107 and 118, respectively.





JEWELL RIDGE COAL CORP., Blair Fork No. 4 mine, Tilford, Perry County, Ky.; J. N. Sparks (left), superintendent of maintenance; his son, Norvil Sparks, electrician: and Paul Yearly, section foreman over the bridge-conveyor section of the mine (Coal Age, December, 1953, p 72).

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experience when you purchase a Wemco Mobil-Mill. This prefabricated, built-to-order HMS plant offers a modern, highly economical method for precision coal cleaning. Behind every Mobil-Mill unit lies Wemco's extensive experience and leadership in HMS equipment manufacture. Attesting to this leadership is the fact that of all HMS plants in the world today, more than 50% are Wemco Mobil Mills.

WEMCO EXPERIENCE RESULTS IN THESE MOBIL-MILL ADVANTAGES

EFFICIENT CLEANING—accurate, consistent separations with high yield over a wide range of sizes and grades.

PREFABRICATED—for quick, low-cost field assembly in minimum time by Wemco or your own crews; easily dismantled and relocated.

FLEXIBLE DESIGN — engineered with a choice of components in combinations to suit individual coal washing characteristics. MINIMUM FIRST COST - comparatively small capital investment per ton of washed coal.

LOW OPERATING COSTS — total costs average as low as 8c to 12c per ton of washer feed.

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Mobil-Mill Size and Model for Every Need

- Plants designed to handle any tonnage.
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- Choice of 3 types of separators:

SINGLE DRUM - for accurately controlled washing of a full range of sizes from 8" to 1/4".

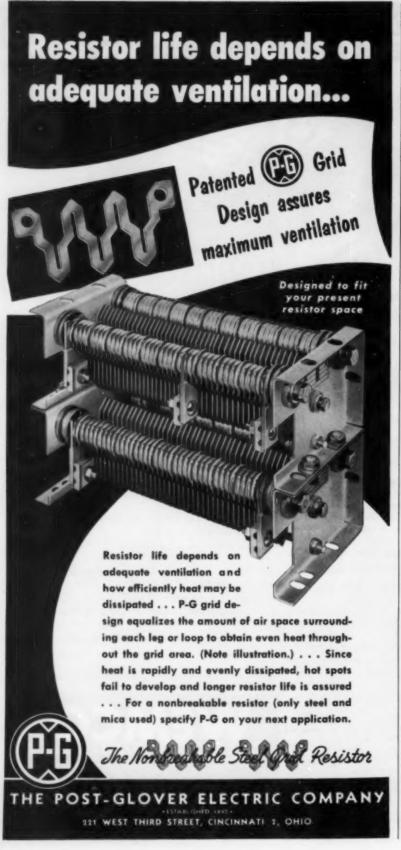
TWO-COMPARTMENT DRUM - for efficient cleaning of coal with middling content requiring two-gravity, three-product

CONE — for economical production of coal up to 4" in size.

Write for Bulletin M-3-M-4 containing further information an Mobil-Mill applications to coal cleaning problems.

WESTERN MACHINERY COMPANY 760-768 FOLSOM STREET SAN FRANCISCO 7 CALIFORNIA

Mobil-Mills - Coal Spirals - HMS Thickeners - HMS Pumps - Sand Pumps Cone Separetars - Drum Separators - Hydroseparators - Fagergren Labore Pagergren & Steffenson Flotation Machines - S-H Classifiers - Attribue HMS Laboratory Units - Devatoring Spirals - Thickeners - Conditioners -





Heads Inland Steel Mines

JOHN T. PARKER (above) last month was named manager of coal properties for the Inland Steel Co., Wheelwright, Ky., succeeding E. R. Price, who retired Feb. 1 after 24 yr of service at Wheelwright. Formerly general superintendent, Mr. Parker joined Inland Steel in 1926 as an engineer in its coal mines at Indianola, Pa. He was transferred to Wheelwright 4 yr later and has served there as mine engineer, mine superintendent and general superintendent. A native of Fayette City, Pa., he attended Carnegie Institute of Technology and also took the Advanced Management Course at the Harvard School of Business in 1947.

insurance. R. D. Greer has been transferred from the power and mechanical department to the mining department as assistant mine superintendent, maintenance, in charge of all underground mining equipment except substations.

Moss Patterson, general manager of mines, has been elected vice president, West Kentucky Coal Co., Madisonville, Ky.

The Philadelphia & Reading Coal & Iron Co., Philadelphia, has announced the retirements of four officials, whose total service with the company exceeds 167 yr. Thomas V. Monahan, superintendent, Mahanoy Div., since 1935, has had 48 yr of continuous service, 33 of which were in a supervisory capacity. Elmer F. Young, mining engineer in the chief engineer's office since 1947, has had 46 yr of service to his record. Harry A. Hechler, assistant engineer, Ashland Div., since 1930, has been with the company for more than 49 yr. John Hicks, transportation engineer since 1929, has been in coal mining for 46 yr. Frank Meyers, assistant division superintendent, Mahanoy Div., will handle the work performed by Mr. Monahan. The duties of Messrs. Young, Hechler and Hicks will be distributed among existing company per-

T. R. Workman has retired as vice

... Smoother power! ... Better performance!

with the NEW TORQUE CONVERTER PAYLOADER



The big, husky 1½ HM "PAYLOADER", the leader in the field, now further establishes its superiority with the extra advantages of a Torque Converter drive. Gives you extra power for tough going, smoother power at all times, more lugging power, more engine efficiency, for faster, lower cost material handling.

Combined with the 4 speed, full reversing transmission, the Torque Converter provides an unlimited range of automatically selected speeds to meet the load and operating conditions. Parts breakage and maintenance are less because shock loads are absorbed.

More than a year of field testing "on the job" gives you proven performance. It's the finest tractor-shovel available — and we'll prove it! Ask your "PAYLOADER" Distributor for a demonstration or write The Frank G. Hough Co., 735 Sunnyside Ave., Libertyville, Ill.

TORQUE CONVERTER DRIVE

More Efficiency — Engine operates at most officient speeds — no laboring or stalling

Lower Maintenance — Oil cushion absorbs load shocks — protects vital parts

Easier Operation — Eliminates much gear-shifting and "clutching"

Greater Output — Operates at highest speed in relation to load



THE HEART of your preparation plant

Successful coal cleaning oftentimes depends upon the proper type of crushing of raw coal, middlings, and refuse. Your crushing equipment is not an auxiliary but is the heart of your preparation plant.

Pennsylvania has specialized in this field and has developed a dependable and accurate method of crusher selection, along with a line of Bradford Breakers, Bradmills, Hammermills, Ring Hammermills, Impactors, Jaws and Single Rolls.

Our engineers welcome the opportunity of working with you on any coal cleaning or sizing problems you have.

Ask us to send you our new catalog of crushers for the coal mining industry, Bulletin No. 4010. Pennsylvania Crusher Company (division of Bath Iron Works, Inc.) 1711 Liberty Trust Bldg., Philadelphia 7, Pa.

PERUSHERSA

Bradford Breakers
Bradford Hammermills
Bradmills
Reversible Hammermills
Non Reversible
Hammermills
Ring Hammermills

Dixie Hammermills
Dixie Non Clog
Hammermills
Single Rolls
Reversible Impactors
Kue-Ken Jaws
Kue-Ken Gyracones

MEETINGS

AIME: Annual Meeting, Feb. 15-18, Hotel Statler, New York City.

American Society of Lubrication Engineers: Annual Meeting and Exhibit, April 5-7, Cincinnati.

AMC, Coal Div.: Annual Meeting, May 3-5, Netherland Plaza Hotel, Cincinnati.

Southern Appalachian Industrial Exhibit, May 26-28, Bluefield, W. Va.

president—operations, West Virginia Coal & Coke Corp., to assume duties as public relations director.

Clyde G. Brehm, supervisor of safety and compensation, Susquehanna Collieries Div. of M. A. Hanna Co., has retired. With the company since 1931, he has written numerous technical papers and articles, and is widely known as a speaker and lecturer on mine safety and related subjects.

Mines Engineering Co., Chicago, will be operated in the future as a division of the Paul Weir Co., it was recently announced. Louis K. Von Perbandt, former Mines Engineering president, is retiring because of impaired health but will continue as a consultant. Officers of Mines Engineering Co. now are: Paul Weir, president; John P. Weir, George H. Chapman and Hollis B. Cain, vice presidents.

Herbert H. Taylor Jr. has been appointed a vice president of the Sterling-Midland Coal Co., Chicago. Mr. Taylor will be concerned largely with the company's development of a new coal field near Stonefort, in southern Illinois.

The appointment of Norman C. Curtin, for the past 7 yr supervisor of field representatives for the Anthracite Institute, to the staff of the Public Relations Management Corp. as technical consultant to the newly created Anthracite Information Bureau, was announced Jan. 14 by Hugh O. Tompkins, chairman of the Anthracite Industry Committee. In his new post, Mr. Curtin will advise on motion-picture productions and the preparation of articles for technical publications, serve as a member of the Anthracite Speaker's Bureau and work with retail dealers to improve service to anthracite consumers and broaden the distribution of new automatic heating equipment.

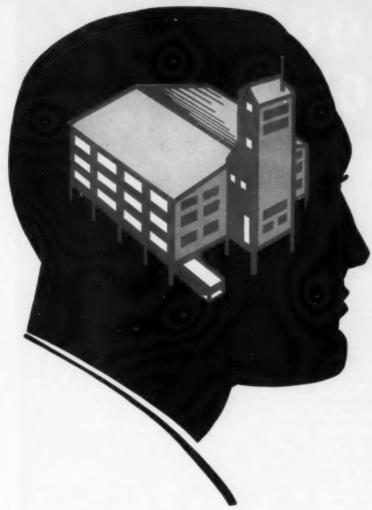
Robert L. Morrison joined the United Electric Coal Cos., Chicago, Jan. 1 as assistant to the president, Frank F. Kolbe. Mr. Morrison formerly was associated with the West Canadian Collieries, Blairmore, Alta., Can.

The promotion of Julius C. Olzer, West Virginia district mine inspector, to acting inspector-at-large was announced Jan. 13 by Frank B. King, newly appointed chief of the Department of Mines. Mr. Olzer, who will continue to work in the Kanawha Div., replaces H. L. Schweinsburg, recently named director of mine rescue and safety for the department.

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"FAIRMONT BUILT"



CLEANING PLANT

 The Fairmont organization consists of competent sales engineers—qualified designers —modern structural and machine shop facilities—erectors utilizing the services of Fairmont experienced personnel.

Thus, the complete responsibility for efficient operation—low maintenance cost — and uniformity of product is vested in the Fairmont organization which guarantees cleaning results.

You can make your coal a better, more marketable product—meet consumers specific requirements—and arrive at a more profitable operation with a "Fairmont Built" plant.

Experienced sales engineers will be pleased to help you solve your coal preparation problems.



Fairmont, West Virginia

Designers and Constructors of Complete Coal Preparation Plants Using Both Wet and Dry Cleaning, Centrifugal and Thermal Drying.





DR. LEWIS E. YOUNG

Dr. Lewis E. Young, 75, widely known mining engineer, died Dec. 27 at his home in Pittsburgh. Following his graduation from Pennsylvania State College in 1900, Dr. Lewis taught at Iowa State College and Colorado School of Mines, and was a director of the Missouri School of Mines and Metallurgy. In 1915, he went to the University of Illinois to study mining problems, later becoming associated with the Union Electric Co. of St. Louis as manager of the steam heating department. In 1927, he was elected vice president, Pittsburgh Coal Co., in charge of mining operations, and served until 1939, when he began a career as consulting mining engineer. He was elected president of AIME in 1949 and was active in various other industry organiza-

George S. Baton, 84, partner in the George S. Baton & Co., consulting engineers, died Dec. 28 at Presbyterian Hospital, Pittsburgh. He was chairman of the board, Greensburg-Connellsville Coal & Coke Co. and the Baton Coal Co., operating mines in Pennsylvania, West Virginia and Ohio. Mr. Baton, a past president and treasurer of the Engineers Society of Western Pennsylvania, was also a member of the American Society of Civil Engineers and the AIME.

L. L. Wylam, 53, federal coal mine inspector attached to the Bureau's Mt. Hope, W. Va., branch, died Jan. 4 following a heart attack. Mr. Wylam became ill while making a mine inspection and died enroute to a hospital. Before his transfer to Mt. Hope last year he was a signed to the Welch field for 9 yr.

Ernest Iselin, 77, chairman of the board of the Rochester & Pittsburgh Coal Co., died Jan. 10 in New York City. Mr. Iselin joined his father's stock brokerage firm of A. Iselin & Co. following his graduation from Columbia University in 1898 and served as a partner until its disolution in 1936. At the time of his death, in addition to his



SAFETY

Teeth that bite deeper mean greater gripping power and safety. Deepercut, sharp teeth on new West Virginia expansion sleeve give more holding power. New plug and shell give greater expansion, flexibility and larger holding area to the fingers, without cutting down on the thickness of the metal. More holding power means greater safety.

Improved ventilation, faster movement of coal and machinery, economy of installation and maintenance and elimination of timbering are yours with West Virginia Roof Bolts. State and government statistics show greatly improved safety records when mines are roof-bolted.

Both expansion sleeve and wedgetype roof bolts are manufactured in West Virginia Steel's modern plant from steel produced in new electric furnaces. A special sprayed compound protects West Virginia Roof Bolts from rust, makes installation smooth and easy. Available in all required lengths. Write for descriptive literature.



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"STACKER"

BARBER-GREENE SUPPLIES THEM ALL

RADIAL STACKERS



FIXED STACKERS







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MINE OWNERS AND OPERATORS know from experience that frequent pipe replacements due to corrosion can be a costly factor in mine operation. During the past 20 years they have been finding a solution to this problem in tough, durable Transite Mine Service Pipe. Made of asbestos, cement and silica by a special process, this pipe stubbornly resists corrosion . . . from the inside and from the outside.

Transite Pipe has other advantages important to mine operations. Light in weight, it is easy to handle...tight "factory made" couplings make installation easy. It is tough and strong...its flexible couplings enable lines to be laid around curves... often without the use of fittings, a big advantage in restricted mine passages.

SUCCESSFULLY HANDLES MANY MINE JOBS

For Mine Drainage, Transite Mine Service Pipe has an exceptional record of corrosion resistance that has enabled it to stand up for extended periods under conditions that have quickly destroyed ordinary pipe.

For water supply lines, Transite's unusually high carrying capacity and its immunity from tuberculation keep pumping costs at a minimum.

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For further information write for Brochure TR-51A. Address Johns-Manville, Box 60, New York 16, N.Y.



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Johns-Manville TRANSITE MINE SERVICE PIPE

connection with R. & P., he was associated as an official or director with a number of business firms in New York and had been active in a number of philanthropic and charitable organizations for many years.

Owen W. Cox, 60, well-known coal operator and business man in Fayette County, West Virginia, died Jan. 17 in the Raleigh General Hospital, Beckley, W. Va. At the time of his death, Mr. Cox was president of the Alaska Coal Co., Laurel Creek Coal Co. and Laurel Smokeless Coal Co. and chairman of the board of the New River Fuel Co., as well as a director or officer of several business firms.

Charles J. Arnett, 59, tipple foreman for the Peters Creek Coal Co., Summersville, W. Va., died Jan. 16 at his home after a long illness.

Preparation Facilities

Uniontown Coal Mining Co., Uniontown Mine, Uniontown, Ky.—Shipment by Deister Machine Co., of eight coalwashing tables with "Lifetime" anti-friction bearing headmotion, and one revolving feed distributor, treating ¼x0 coal at 120 tph.

Consolidation Coal Co. (W. Va.), No. 93 mine, Byrne, W. Va.—Contract closed with Fairmont Machinery Co. for one Fairmont washer for handling 5x3; capacity, 300 tph.

Perry Coal Co., St. Ellen mine, O'Fallon, Ill.—Contract closed with Roberts & Schaefer Co. for complete pneumatic cleaning plant with Super-Airflow pneumatic coal cleaners; capacity, 60 tph of %x0.

Imperial Coal Corp., Kenstone mine, Clymer, Pa.—Contract closed with Roberts & Schaefer Co. for complete pneumatic coal-cleaning plant including Super-Airflow coal cleaner; capacity, 50 tph of %x0.

Sun Ray Coal Co., Caryville, Tenn.— Contract closed with Roberts & Schaefer Co. for Hydro-Separatior coal-cleaning equipment; capacity, 100 tph.

Rosedale Coal Co., Morgantown, W. Va.—Contract closed with Roberts & Schaefer Co. for complete pneumatic coal-cleaning equipment; capacity, 50 tph of %x0 raw coal.

Pardee & Curtin Lumber Co., Bergoo, W. Va.—Contract closed with Roberts & Schaefer Co. for Hydro-Separator coalcleaning equipment and accessory machinery to handle 4½ x ¾ coal at 65 tph.

Royalty Smokeless Coal Co., Cliff Top, W. Va.—Contract closed with Roberts & Schaefer Co. for complete coal washery with Jeffrey Baum-type jig to wash 8x0 coal at 340 tph.

Glen Alden Coal Co., Huber colliery, Ashland, Pa.—Contract closed with Wilmot Engineering Co. for one 8-ft-diameter Wilmot Hydrotator to prepare No. 4 coal, feed capacity, 80 tph; and two 12-ft-diameter Wilmot classifiers to prepare No. 5 coal, total feed capacity, 130 tph.



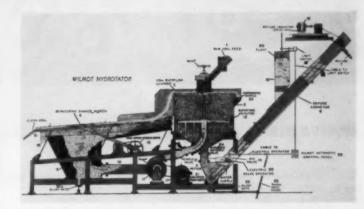
Wilmot Automatic Recovery System produces profits from fines 2 ways

he Wilmot system for recovering coal fines is enabling an increasing number of operators to use these two possible sources of carry-over to profits: (1) Saving in refuse disposal cost; (2) Sale of fines.

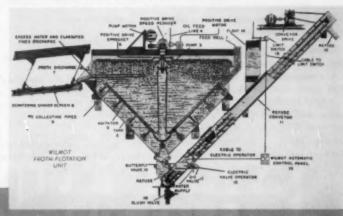
The Wilmot system is entirely flexible in application, employing: Wilmot Hydrotators to recover all specified sizes down to $\pm 3/64$ " mesh; and Wilmot froth-flotation units to complete recovery down to ± 0 mesh, if desired. These Wilmot units feature automatic controls which have effected remarkable increases in the ratio between yield and labor costs. We invite you to see how this

near approach to "push button" operation is making it practical and profitable to recover the fine sizes.

Send for BULLETIN H-511 an Good-Cleaning



Above, Wilmot Hydrotator coal cleaner; below, Wilmot froth-flotation unit. Both have automatic controls, with visible-audible signals. For all sizes of plants. Also heavy-media units for larger sizes of coal.



WILMOT ENGINEERING CO.

Plant:



MODERN MINING demands PROTECTED CABLES

Mine operators everywhere are turning to modern improved methods to step-up their efficiency and production. And in all cases this means greater electrification: with portable power centers, junction and distribution facilities, continuous mining machines, high capacity loading and drilling equipment, etc.

Ruberoid Insulating Tape can insure more economical operation of this equipment by providing complete protection for electrical cables. Ruberoid Insulating Tape strengthens cables with a vise-like grip so that you can drag them anywhere with complete safety... through acid pools and over jagged surfaces. Check these seven cost-cutting features of Ruberoid

Insulating Tape to assure longer life for your cables:

- · Double grip . . . both sides adhesive
- · Great tensile strength . . . tough
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- Extra thick . . . one layer insulates

Exceeds A.S.T.M. specifications by 40% in adhesiveness, 25% in tensile strength, 110% in dielectric strength.

For further information write The Ruberoid Co., 500 Fifth Avenue, New York 36, N. Y.

The RUBEROID Co.

ASPHALT AND ASBESTOS BUILDING MATERIALS

Association Activities

Evans Conciliation Board Head

Evan Evans, chairman of the board, Lehigh Navigation Coal Co., Lansford, Pa., and operator-member on the Anthracite Board of Conciliation from District 7 since 1951, has assumed the chairmanship of the board, succeeding the late George A. Roos. Mr. Evans is the seventh man to hold this post in the board's 50-yr history.

Todhunter Re-Elected

North Cambria Council, Joseph A. Holmes Safety Association, has re-elected Richard T. Todhunter, Jr., Barnes & Tucker Co., Barnesboro, Pa., president for the fifth consecutive year. George P. Resick, state inspector for the 15th Bituminous District, was re-elected vice president; and Robert Falatic, tipple foreman, No. 20 mine, Barnes & Tucker, was named secretary-treasurer, succeeding Kenneth Richardson.

Form Mine Disaster Group

First officers of the newly organized Northern Cambria County Mine Disaster and Emergency Organization, elected at a meeting in Barnesboro, Pa., include, president, George P. Resick, state inspector, 15th Bituminous District; vice president, Dennis J. Keenan, general superintendent, Sterling Coal Co.; and secretary-treasurer, David K. Kreischer, federal mine inspector. The group will organize trained rescue and recovery crews to be on call at all times.

EQUIPMENT APPROVALS

Seven approvals of permissible equipment were issued by the U. S. Bureau of Mines in December, as follows:

Joy Mfg. Co.—Type ICM-IH continuous miner; two 65-hp, one 15-hp, two 71/2-hp and two 3-hp motors; 440 v, AC; Approval 2-971A; Dec. 7.

Joy Mfg. Co.—Type DM-8 drilling machine; one 26-hp and one 60-hp motor; 250 v, DC; Approval 2-972; Dec. 8.

Lee-Norse Co.—Model CM-36 miner; two 40-hp, one 15-hp and two 8- or 10-hp motors; 230 v, DC; Approval 2-973; Dec. 21.

Goodman Mfg. Co.—Type 500 miner; one 100-hp and one 50-hp motor; 250 v, DC; Approval 2-974; Dec. 21.

Joy Mfg. Co.—Types 32E15P-1 and 32E15PX-1 cable-reel shuttle cars; three 71/2-hp motors; 250 v, DC; Approval 2-975; Dec. 23.

J. H. Fletcher & Co.—Type DAA-C2-T1-R1 roof-bolting and timbering machine; 10-hp motor; 230 v, DC; Approval 2-976; Dec. 29.

Joy Mfg. Co.—Type 22-HD core drill; 15-hp motor; 550 v, AC; Approval 2-977A; Dec. 31.

The strongest rack bar makes the toughest jack



Long a favorite with coal miners is the 516 MT. It can raise 5 tons up to 91/2 inches, is only 16 inches high when closed, has the famous oblong rack bar for greater strength and dependability.

FF-NORTO

"Giving Industry A Lift Since 1883" LOCKS

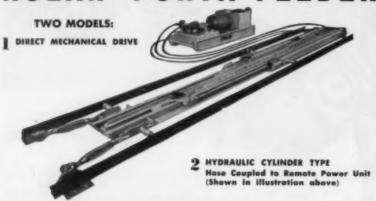




MOVE COAL FASTER

with the efficient time-proved

NOLAN PORTA-FEEDER



These two Nolan models will help you meet every requirement and condition in spotting cars for loading . .



and may save you as bigh as 40 minutes per shift!

The Nolan Porta-Feeder has been in successful use in many mines for over two years. This modern method of moving cars has been accepted as the most efficient in the industry. Its ease of installation and quick movability recommends its use in any mine.

The Porta-Feeder mounts between the rails on top of the track ties, and is secured by jacks. Little or no excavation or preliminary foundation work is necessary. The construction is strong and massive. There are no ropes or cables. Reciprocating pushing dogs deliver constant forward feeding motion. We will be glad to show you a mine in your vicinity where the Nolan Porta-Feeder is operating. Write us now.



THE NOLAN COMPANY 106 PENNSYLVANIA ST.

BOWERSTON, OHIO

COAL MEN ON THE JOB

CHRISTIAN COLLIERY CO., No. 4 mine, Mahan, W. Va. (left photo): R. F. Overly (left), superintendent; C. A. Schindler III, mining engineer; Finley Cotrell (rear), chief clerk; and Fred Chesnutt, general mine foreman.

BLUE DIAMOND COAL CO., No. 1 mine, Blue Diamond, Ky. (right photo): W. M. Engle (left), chief electrician: Henry Williams, dispatcher; and Noah Wright, general mine foreman.



Yes-feed by weight

with the MERRICK FEEDOWEIGHT, a self-contained automatic conveyor scale, with automatic gate for feed rate control. Powered feed regulator operates gate, without restraint on scale beam. Uniformly feeds bulk material BY WEIGHT; automatically totalizes weight of materials fed. Simple to operate. Slow moving parts mean larg life. Easy to install,

Manufacturers of

The Marrick WEIGHTOMETER, which weighs any material carried on a belt conveyor without interng conveying operation. Complete descriptive

MERRICK SCALE MFG. CO. Engineers and Mirs. of Automatic Weighing Equipment PASSAIC, N. J.



Thermoid Conveyor Belting cuts handling costs on rugged mining jobs



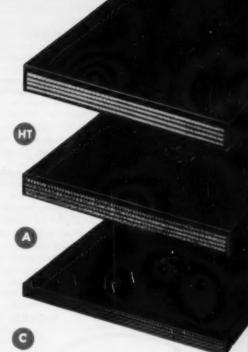
There's a Thermoid Conveyor Belt designed to lower your handling costs on every mining job. Here are three examples:

HI —For extremely abrasive materials such as coal, granite, trap rock, flint rock, quartz ore;

A —For slag, lime rock, crushed stone and other highly abrasive materials;

C —For moderate abrasives such as sand, loam, soda, gravel.

Thermoid's exclusive impregnation process welds carcass and cover into an exceptionally strong, durable belt. Finest quality reinforcement and specially compounded rubber stocks assure long life...lower your handling costs per ton. Your Thermoid Distributor can help you select the Conveyor Belt best suited to your requirements. Or if you prefer, write direct for Catalog #3679.



Conveyor & Elevator Belting • Transmission Belting F.H.P. & Multiple V-Belts • Wrapped & Molded Hose



Rubber Sheet Packings • Molded Products Industrial Brake Linings and Friction Materials

Thermoid Company · Offices & Factories: Trenton, N. J., Nephi, Utah



• MORRIS TYPE R SLURRY PUMP at the left is on continuous 24-hr. duty delivering 1000 GPM of a 170° lime slurry at 100′ head. Fifty-HP motor operates at 1180 RPM. Intermittent-duty pump at right delivers 200 GPM at 50′ head with 7½-HP motor turning at 880 RPM.

n slurry-handling operations, "long-term service" is a meaningless claim unless the pump will work day-in and day-out with a minimum of maintenance time, trouble and expense

Morris Type R Slurry Pumps—with an established reputation for longer life—also incorporate in their design exclusive features which result in easier installation . . . fewer interruptions to service...less overhaul...fewer replacements.

To provide uninterrupted service . . .

The gland is under suction pressure only. This reduces leakage and dilution . . . keeps harsh abrasives out of the stuffing box . . . practically eliminates packing troubles.

There are no internal studs or bolts. Caustic and corrosive solutions cannot seep past threads and cause maintenance headaches.

To make installation and dismantling easy . . .

Shell is interchangeable for right or left hand rotation. Suction and discharge nozzles can be rotated around the axis of the pump to a total of 72 different locations.

Impeller removed without disturbing the piping. You simply loosen 4 outside clamping bolts and pull off the end cover. This feature alone saves considerable time and labor.

• Free Service. Morris Engineers will be glad to recommend the pump best suited to your needs for size, capacity, etc. Send necessory data today . . . include request for Bulletin 181.

MORRIS MACHINE WORKS

Baldwinsville, N. Y. Sales Offices in Principal Cities



NEWS BRIEFS . . . Cont'd Begin on p 139

road and other property and the killing of a non-striker last May. At the end, some 150 men were picketing the property on shifts, it was reported.

Strip-Mine Control Bill Before Kentucky Legislature

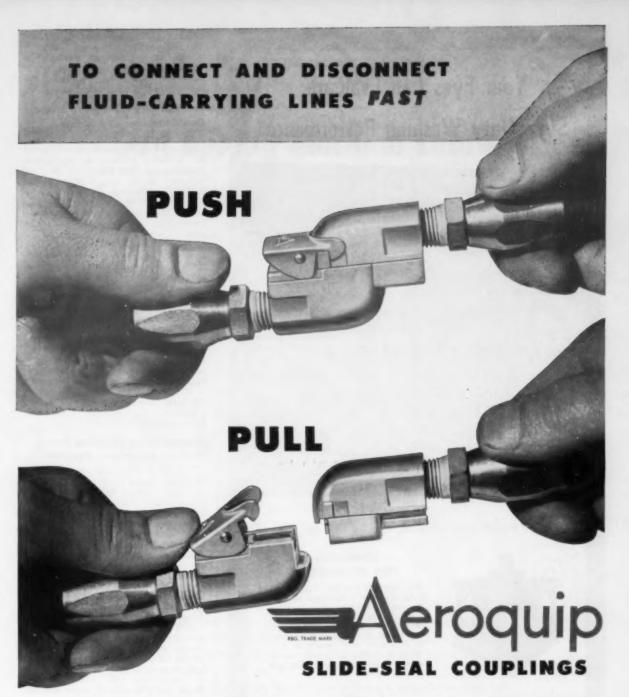
A bill to regulate the strip mining of coal in Kentucky was introduced into the state legislature Jan. 13, with the strong backing of Gov. Wetherby. Under the measure, which was drafted by Conservation Commissioner Henry Ward, strip-mine operators would pay a basic fee of \$50, plus \$10 for each acre or fractional acre to be stripped, and file a bond of \$100 to \$250 per acre or fractionthereof. Mining in violation of the law would bring fines of \$100 to \$5,000.

The bill provides for the creation of a strip-mining and reclamation commission to be composed of the conservation commissioner, the chief of the Department of Mines and Minerals and the director of the commission. In enforcing the act, the commission would be empowered to encourage and conduct research and experiments; adopt general rules and regulations for stripping after public hearings; order operators to reclaim stripped land, after hearings; examine or compel issuance of production Under regulations to be records, etc. Under regulations to be adopted by the commission, operators would have to prepare and carry out a reclamation plan for stripped property. In his biennial message to the legislature. Gov. Wetherby pointed out that control bills had been before the legislature without enactment since 1948 and said: "Each generation must be aware of its responsibility to the next. A generation is only temporary, but the ravages of strip mining have mutilated the topographic face of Kentucky forever. Without control, thousands of additional acres will be destroyed."

Dynamitings Add \$5,000 to Operators' Reward

An additional \$5,000 reward for the apprehension of those responsible for recent dynamitings at strip-mining operations in Pennsylvania, making the total now \$15,000, was announced last month by the Central Pennsylvania Open Pit Mining Association. According to reports, an explosion in late December destroyed the tipple of the Red Ridge Coal Co., near Dysart, Pa., with an estimated damage of \$10,000 to \$15,000. In Beaver County, a dynamite blast destroyed strip-mining equipment worth \$60,000 owned by the Negley Fire Clay Co. Undischarged dynamite bombs also were discovered in equipment of the

NEWS of your company, personnel changes and other activities, are interesting to other Coal Age readers, so why not be sure to tell us about them. Write The Editor, Coal Age, 330 W. 42 St., New York 36, N. Y.



This Aeroquip development saves you time and money!

LOW COST . . . Aeroquip Slide-Seal Couplings connect and disconnect fluid-carrying lines instantly assuring full flow of fluids when connected, and perfect seal of each half when disconnected.

LIGHTWEIGHT AND COMPACT... They are ideal for use in confined areas and may be used to advantage in a wide variety of applications.

SIMPLE DESIGN . . . Only four working parts and two "O" rings assure positive performance and foolproof operation.

ADAPTABLE for use with many fluids including hydraulic fluids, hot oil, crude and fuel oils, anti-freeze solutions, gasoline, Diesel fuels, air, water, and other fluids.

Descriptive literature is available . . . please write.

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AEROQUIP PRODUCTS ARE PULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

Your Eyes Can Evaluate SuperDuty Washing Performance



Right before your eyes, the Super-Duty Diagonal Deck Table separates high gravity impurities from your fine coal sizes . . . thoroughly and efficiently. You see exactly what you're doing.

Loss of coal in the refuse is less than with any other machine or process on the market. Quality of the washed coal product is at top level and capacity is exceptionally high.

When these advantages are combined with the matchless SuperDuty operating economy, your profit yield is highly satisfactory.

To get complete information, send for Bulletin 119.



CONCENCO FEED DISTRIBUTOR

The Concenco Revolving Feed Distributor is a heavily fabricated all steel machine with meter drive requiring 1 H.P. or less in operation. It effectively provides a splitting of feed into any desired number of equal portions, to accurately feed circuits or machines in battery for greater overall efficiency. Unexcelled for feeding coal washing tables.

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CONCENTRATOR
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* The ORIGINAL Deister Company * Inc. 1906

Dodds Coal Co., near New Galilee, Pa. The original \$10,000 reward was announced by the operators' association in December following dynamitings at properties of the Bradford Coal Co. and the Diamond T. Stripping Co.

Lubrication Engineers to Study Coal-Machinery Problems

The American Society of Lubrication Engineers has announced a special panel to discuss "Lubrication Application Problems and Their Solution in the Coal Industry" at its Annual Meeting and Exhibit in Cincinnati, April 5-7.

All representatives of the coal industry are invited to participate in the discussion and bring their problems to the panel. Chairman of the panel will be G. R. Spindler, director, School of Mines, University of West Virginia, Morgan-town, W. Va. Panel members representing coal operators will be Wayne S. Fuhr, lubrication engineer, Hanna Coal Co. Div. of Pittsburgh Consolidation Coal Co., Adena, Ohio; and W. R. Wood, electrical superintendent, the Berwind-White Coal Mining Co., Windber, Pa. Representing coal-machinery builders: Joseph J. Slomer, Goodman Mfg. Co., Chicago; and George C. Delmaso, product engineer, Joy Mfg. Co., Franklin, Pa. Representing the petroleum industry: F. C. Robert, lubrication engineer, Gulf Oil Corp., Library, Pa.; and C. J. Moser, lubrication engineer, the Texas Co., Charleston, W. Va.

Pennsylvania Planning Board Outlines Bituminous Program

A three-point program to rejuvenate the Pennsylvania bituminous coal industry was outlined last month by the Pennsylvania State Planning Headed by a readjustment of freight rates, the recommendations also suggested better salesmanship and expanded research on the part of the industry. The most immediate problem of Pennsylvania's soft coal industry is to retain its relative position and employment and, if possible, to regain some of the lost markets for its products," the board said in a special study report issued in booklet It is said that railroad rates have reached the point where distant coal producers can compete with more favorably located mines and "it is this characteristic of the freight-rate structure that has, in certain cases, severely hampered the sale of Pennsylvania coal." The board also urged that the industry make available to its salesmen courses in combustion engineering and that further research in the problems of producing, preparing and utilizing coal be undertaken.

Overland Belt Offers New Economies, Backers Say

Ohio's proposed 103-mi conveyor-belt line for movement of iron ore and coal between Lake Erie and the Ohio River gained added incentive last month when top conveyor engineers announced that belts now can operate nearly twice as fast as the maximum speed estimated 5 yr ago when plans for the project first were announced. H. B. Stewart Jr.,

Add Up the Savings with

Gulf Mining Machine Lubricant

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When you use Gulf Mining Machine Lubricant you can eliminate two or more other lubricants, depending on the type of cutting and loading equipment you operate. At the same time you provide better lubrication for the bearings and gears.

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Cut loading costs with HSD Hydraulic Car Spotters!

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JOHNSTOWN, PA.

president of Riverlake Belt Conveyor Lines, Inc., the company which proposes to construct and operate the overland conveyor, welcomed the statements of the engineers as "an added demonstration of the value of the project." This conveyor development, along with other important factors, "may substantially double the \$45 million maximum annual savings in ore and coal freight rates we figured originally," he added.

The Riverlake Engineering Council is working on an entirely new study of the proposed cross-country conveyor belt, Mr. Stewart said, in view of recent technological developments and new economic factors. Before it can go ahead, the Riverlake project must await action by the Ohio General Assembly giving conveyor companies the right to operate as common carriers. The state legislature twice has failed to take a floor vote on proposed conveyor bills due to railroad opposition, Mr. Stewart pointed out, but legislation again will be introduced in 1955

Fire Damage Totals \$635,000 At Three Coal Companies

A fire causing an estimated loss of \$500,000 destroyed the No. 1 commissary and general appliance building of the Inland Steel Co., Wheelwright, Ky., Jan. 10. The blaze, discovered by a night watchman at 4 am, was believed to have resulted from a short circuit in the building's elevator shaft. Firemen from other communities joined Wheelwright fire fighters in keeping the flames from the adjoining buildings on the town's main street. E. R. Price, manager of coal operations for Inland Steel, who estimated the loss, reported that only the credit records had been saved. A fire Jan. 13 in the No. 2 tipple of the Clinchfield Coal Corp., Dante, Va., resulted in damage estimated at \$75,000 by company officials. Firemen and some 100 company employees fought the blaze for almost 4 hr before bringing it under

Earlier on Jan. 4, fires which company officials believed were set because of a labor dispute, caused damage estimated at \$50,000 at the main tipple of the Majestic Collieries Co., Majestic, Ky., and an estimated loss of \$10,000 at the company's Howard Mounts truck mine. Employees at Majestic's main mine, who had quit work Dec. 29 in a dispute over layoff of about half the working force, returned to their jobs Jan. 7, and on the same day the company announced a \$3,000 reward for information leading to the arrest and conviction of those responsible for the two fires. Kentucky State Police believed that the fires were caused by 9 to 12 men roaming the area in three cars, it was reported. A small blaze was also discovered at another of the company's properties but was extinguished without damage.

Group to Study Prospects for New Mexico's Coal Industry

A study looking to the development and utilization of New Mexico's 61 billion tons of coal reserves has been in-

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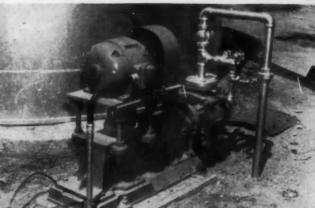
"COMPANIONS IN ECONOMICAL OPERATION"

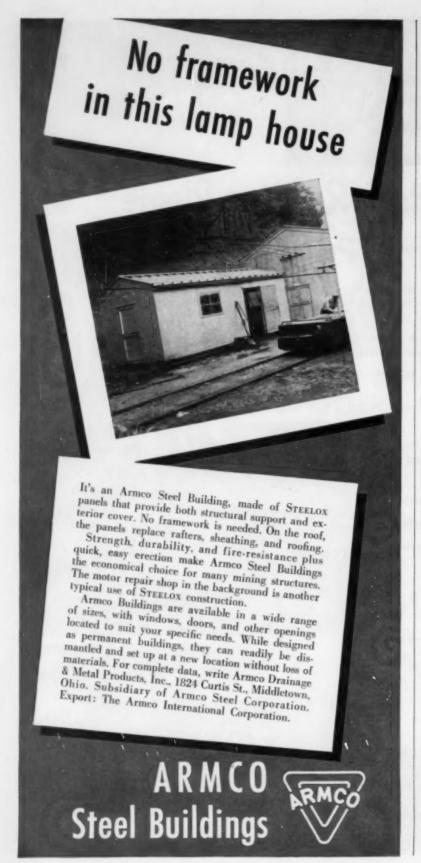
Wilfley Acid Pump



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augurated by a group of federal and state agencies meeting at the request of Sen. Clinton P. Anderson (D., N. Mex.). Pointing to the steady decline of New Mexico's coal production during the last decade, Sen. Anderson suggested that utilization of coal could fill the gap between the depletion of oil and gas reserves and the development of atomic resources, and also stated that the price of natural gas and petroleum has risen to the point where the development of coal and oil shales as sources of fuel is becoming economically feasible.

becoming economically feasible.

Meeting at Sen. Anderson's office were representatives of the State Land Office; New Mexico Institute of Mining & Technology; University of New Mexico; New Mexico Education Assn.; New Mexico Bureau of Mines; U. S. Geological Survey; Interstate Streams Commission and State Legislative Counsel Service. An eight-member committee, with each agency represented, was appointed to undertake a four-point study: (1) to seek additional surveys on the state's coal reserves; (2) to review processes of producing coal; (3) to study the petrochemical industry; and (4) to seek a basis for greater federal appropriations for coal surveys, studies and other projects.

AGE System Opens 14th Plant; Coal Delivered by 4½-Mi Belt

The American Gas & Electric System has placed its 14th major power plant in operation and the second within the past 6 mo, it was announced late in December. The newest plant is The Ohio Power Co.'s Muskingum River steamelectric generating station, whose first 200,000-kw unit is now in operation. The plant, which will cost \$50 million when its generating capacity of 400,000 kw is attained, is located near Beverly in southeastern Ohio. The Muskingum River plant is a "twin" station of the Appalachian Electric Power Co's new \$50 million Kanawha River plant at Glasgow, W. Va., which began oper-ating last July. In addition to the 400-000-kw capacity represented by the initial units at Muskingum and Kanawha, which raised the total AGE System capacity to 3,419,000 kw, another 600,000 kw is under construction.

An unusual feature of the new installation is the 4½-mi conveyor belt delivering coal from a preparation plant at the mine. Operating at a rate of 600 fpm, the 36-in belt has a capacity of 800 tph and consists of 14 sections ranging from 500 to 2,964 ft long. It is powered by 14 motors with a total capacity of 1,435 hp and in some places operates on inclines up to 12 deg. On its way to the plant the belt crosses the Muskingum River via a suspension bridge 65 ft above the river level.

Two Coal Companies Termed "Excellently Managed" for 1953

The Lehigh Coal & Navigation Co., Philadelphia, and Pittsburgh Consolidation Coal Co., Pittsburgh, have been certified as "excellently managed" by the American Institute of Management, New York. Pittsburgh Consol received the GM DIESEL CASE HISTORY No. 534-130

USER: Preskitt Brothers Mines, Birmingham, Alabama

INSTALLATION: GM 3-71 Diesel powers Buckeye %-yard shovel stripping overburden and coal.

PERFORMANCE: Has worked 40 hours per week for 6 years—about 12,000 hours—with no repairs on engine. Uses about 2% gallons of fuel per hour.



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Not One Dime for Engine Repairs

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on the job day in and day out, but when service is needed, a phone call to your local GM Diesel distributor brings quick service and fast delivery of low-cost parts. Clean, simple design makes maintenance easy and economical.

Call your GM Diesel distributor today. Let him show you how to get more power at less cost in new equipment or in your present rigs.

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award for the fourth consecutive year, Lehigh Coal & Navigation for the third. According to Jackson Martindell, president of the institute, only 348 companies in the United States and Canada, out of the 3,000 leading concerns whose methods were studied, were found eligible to receive the designation for 1953. "Recognition of superior management in particular companies is the first step in improving corporate practices generally throughout the country," the AIM official said.

And For Your Information . . .

Rare radioactive minerals have been found in prospecting on the 3,400 acres of land it leases in Ashe County, North Carolina, the H. & H. Contracting Co. reported late in December. Ore samples have been sent to the AEC and a private laboratory for analysis and "from all indications the deposits are hot," Nicholas Rochella, engineer for the West Virginia stripping firm.

A new schedule for Pennsylvania workmen's compensation insurance rates for the coal mining industry, reflecting an over-all increase of about 5%, has been announced by the State Insurance Department effective Jan. 1. It is estimated that the new rates will cost mining companies about \$259,160 in payments to the fund.

The Central Indiana Coal Co., Little John Coal Co. and Stonefort Corp. were merged Jan. 1, with the Stonefort Corp. as the surviving organization. Policies and personnel at the various properties were not to be affected by the merger, the company announced.

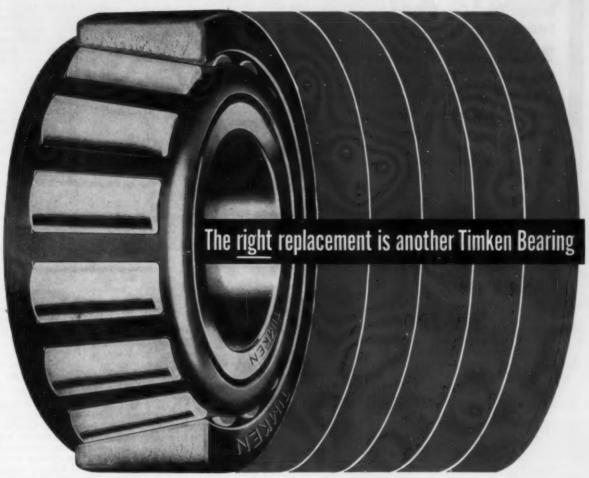
The West Kentucky Coal Co. filed suit in federal court Jan. 11 for authority to terminate the \$1,750,000 welfare fund for its 800 production workers now in effect. Stating that it was committed to a contract with the UMWA, the company asked that enough of the funds be set aside to continue \$100 monthly pension payments to its 91 retired employees and that the remainder, after payment of court costs, be used to set up a welfare fund for non-production workers who will not be covered by the UMWA Wel-fare and Retirement Fund.

The Wheeling Steel Corp. has awarded the Koppers Co., Inc., a contract for the complete rebuilding of its No. 1 coke-oven battery at its East Steubenville The battery will be torn down to the foundations, starting about April 1, and replaced by 47 chemical-recovery ovens of the Koppers gun-flue devery which will carbonize about 772 tons of coal daily. Rebuilding of the battery will complete a coke-oven modernization program Wheeling has had under way for several years.

The home office of the Peabody Coal Co. began operation in Taylorville, Ill., Jan. 4. As previously announced, the company's executive and general sales offices remain in Chicago.

The Iroquois Coal Co., Chicago, reportedly is assembling a large block of coal acreage in Union County, western

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Shaking and vibrating screens that blind and afford poor service life can waste valuable time and money — eat up profits. The tapered shape of openings and the steps or flanges of Hendrick Flanged Lip Screens provide better separation and practically eliminate costly delays due to blinding.

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Kentucky, on the Ohio River. It will be offered for development by an operating company but actual opening up of the property will be determined by economic and market conditions, it was pointed out.

Danish coal importers report that they can save \$2.80 a ton in buying high-grade coal in the United States rather than in Great Britain or Germany, even though the freight costs twice as much. The Danish State Railways last month announced the purchase of 10,000 tons of U. S. coal for March delivery and purchase of an additional 40,000 tons is planned. An additional factor involved is that at the moment Great Britain cannot supply coal of the quality normally required. Britain and Germany remain fully competitive, however, for lower-grade coals.

The \$15 million expansion of the Wankie Colliery, the only major source of coal for both Northern and Southern Rhodesia, is making progress, it was reported last month. As a part of the firm's plan to increase output to 5 million tons annually by the end of 1956, a new No. 3 colliery is expected to begin production soon and reach its annual capacity of 2½ million tons by the end of the year. Extensive changes are being made at the existing Nos. 1 and 2 mines, including the use of machine mining and new production methods.

A high-Btu gas produced from coal seems to be the "most logical substitute" for natural gas when the supply of natural gas diminishes, a study by the American Gas Association shows. Any substitute gas must have a high heating value to replace natural gas, the report states, and "coal is the only reasonable choice as a raw material" because of the country's extensive coal reserves.

"Total Selling" Is Theme Of CHS "Sales Package"

Coal Heating Service Div., National Coal Association, recently revealed a "Sales Package" designed to help coal shippers and retail coal merchants who sell, or want to sell, commercial and small industrial tonnage. Theme of the new sales aid is "Total Selling," subject of an address in December by J. Nelson Stuart, CHS manager, before the North Carolina Coal Institute.

Contents of the package include a copy of Mr. Stuart's address, correspondence and a booklet showing how to sell coal to school systems, tables and formulas for establishing comparative fuel costs, samples of mats for newspaper advertising, a booklet containing testimonials from plant managers who have found coal the cheapest and best fuel, and an account of the organization and operations of the Minneapolis-St. Paul Minute Men, whose quick action has averted switches to competing fuels in that area.

"Sales Packages" are available upon request to Coal Heating Service Div., Southern Building, Washington 5, D. C.

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When you Buy a Loader for **Rock Work**

We believe there is only one basis on which a loading machine should be purchased and that is on performance. And by performance we include operating cost, efficiency, maintenance, dependability and. of course, tonnage.

Throughout the mining industry the Whaley "Automat" has been recognized for many years for its superior mechanical endurance and its dependability in staying with the tough job demanded of a loader

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Driving entries, brushing, taking top and bottom rock, in thin seam coal particularly, is costly dead work. Yet, every dollar saved in dead work is just as vital to ultimate profits as the dollar saved in productive work. Old or worn loaders or make shift equipment cannot cope with the demands of today for low cost operation.

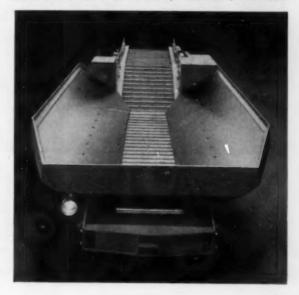
More than ever, our latest improved Whaley "Automat" is essential for fast removal of rock and at greatest savings. Either the Track Type or Crawler Mounted models are available to suit your require-



Our Crawler Mounted "Automat" for Coal Loading has all the advantages of the Track Type Machine, plus the off track operation.

Our new Crawler Mounted Transfer Car, used as a surge bin, enables the loading machine to run continuously, increases output of loader. Basic height is 453/4", and with side boards up to 55", its capacity ranges from 250 to 350 cubic feet. It discharges in 30 to 50 seconds. This machine, shown below, is available for reasonable delivery. Full details upon request.

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AIME to Honor Campbell

L. C. Campbell, vice president, Eastern Gas & Fuel Associates, and president of the National Coal Association, will be presented Feb. 17 with the Erskine Ramsay Gold Medal, the highest engineering recognition in the coal mining industry, during the annual meeting of the AIME in New York. As head of EG&FA Coal Div., Mr. Campbell supervises operation of mines in Pennsylyvania and West Virginia and is thus the second Pennsylvania and the first West Virginia coal man to receive the award. The citations with the award will recognize Mr. Campbell's contributions to the safety and wellbeing of employees and to the advancement of mechanical mining.

Lewis Adds \$50,000 to Aid Dock Union

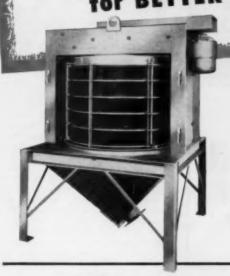
The International Longshoremen's Association, the union expelled from the American Federation of Labor last fall on charges of gang domination, reportedly received another \$50,000 loan Jan. 5 from John L. Lewis, UMWA head. With the previous loan made in December (Coal Age, January, p 112), Mr. Lewis so far had backed the union in its fight against the AFL to the extent of \$100,-000. He had promised "unlimited financial support" as necessary, high officials in the ILA reported in announcing the latest loan. Figures of \$1 to \$5 million in assistance were mentioned in some reports but there was no confirmation from either Mr. Lewis or ILA officials. During the month, Mr. Lewis reportedly held several talks with Capt. William V. Bradley, head of the ILA, and other officials. He also held discussions with David Beck, president of the International Brotherhood of Teamsters, AFL, which is one of the sponsors of the new AFL union that is seeking to take bargaining rights away from the ILA, but he was still behind the ILA after his talk with Mr. Beck, reports indicated. In one session with Capt. Bradley, Mr. Lewis was reported to have demanded that the ILA clean house immediately and stated that no more financial aid would be forthcoming until it did. According to one press report, Mr. Lewis thus far had made available only \$15,000 of the \$100,-000 in loans to the ILA publicly announced.

Senate Approves Participation In St. Lawrence Seaway

The Senate Jan. 20 approved United States participation in construction of the St. Lawrence Seaway by a vote of 51 to 33. Approval of the project, which has been before Congress in one form or other for over 20 yr, was considered an important victory for President Eisenhower, who has strongly backed construction of the Seaway. Opponents of the plan were reported to have conceded their defeat in the Senate several weeks before the vote and were expected to concentrate their further efforts in the House of Representatives. They were hoping to block the bill in the Rules Committee, which channels the flow of legislation to the House floor, it was

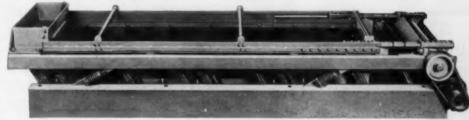
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SYMONS SCREENS have been serving the coal industry for almost twenty years, in many hundreds of screening applications throughout the world. These quality screens have gained an enviable reputation for dependability, efficiency and economy . . . backed by the same high standards of accuracy, design and workmanship, and the same advanced engineering that is used in the manufacture of all Nordberg Machinery.

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The cast iron, RUBBER-SEALED case eliminates the hazards of coal dust and water seepage...yet is readily accessible. Unit is compact, only 12 "x7" x434". Extra creepage insulation is provided by using 34" mounting panel and large clearances to ground.

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Sales Agent: Kanawha Rall & Machinery Co. Charleston, W. Va. reported. The St. Lawrence Seaway and Power project has long been opposed by coal mining interests, UMWA and other unions, railroads and other organizations.

Pennsylvania Operators Ask Revision of Rail Rates

A wholesale attack on eastbound rail rates on bituminous coal from central Pennsylvania was made by complaints filed simultaneously Jan. 15 with the Interstate Commerce Commission and with the Pennsylvania Public Utility Commission. Joining in the actions were the Eastern Bituminous Coal Association and certain individual coal operators in the Clearfield and Cumberland-Piedmont-Somerset regions of Pennsylvania and Maryland. Two major allegations were made: first, that the rail rates from central Pennsylvania to the east are excessive and unreasonable; and second, that the rates from central Pennsylvania are unduly prejudicial as compared with the rates from northern West Virginia, from the Westmoreland district of Pennsylvania and the Gauley district of West Virginia. The rates "are part of an ancient rate structure that no longer serves the needs of shippers," the complaints said. The present high rates discourage and inhibit movement and "a serious question is raised as to whether the mining of bituminous coal in the Clearfield and Piedmont districts can, in the years to come, be conducted on a successful basis unless the freight rates are readjusted," they maintained.

Mine Safety Bill Before Virginia Legislature

A measure that would make into law the recommendations of last year's special Mine Safety Study Commission was introduced into the Virginia Senate Jan. 21. The bill was introduced by Sen. George M. Warren and Frank P. Burton, who were members of the special study commission. The bill covers various aspects of mine safety, including employment of a certified mine foreman at any coal mine with three or more employees, mine ventilation, more control of explosives and detonating equipment, use of black powder only in pellet form, and the broadening of the laws to include all mines in some respects. The proposed law has the backing of both the miners and the operators, according to Sen. Warren.

British Raise Wages for More Output as 1953 Tonnage Dips

British toal production in 1953 was 223,518,000 tons, a decline of 1,267,000 tons from the 1952 output, the Ministry of Fuel and Power reported Jan. 5. At the same time, negotiations were continuing on the mineworkers' demand for a wage increase of about 32c a shift for underground workers and 29c a shift for surface men, which would bring weekly wages to the equivalent of \$22.40 and \$19.60, respectively. Later on Jan. 21, it was reported that the mineworkers' leaders were accepting a compromise offered by the NCB that would bring the weekly

designed for higher production

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Outstanding performance features make PROX Coal Cutting Equipment leaders in the industry today! PROX cutter chains, tool steel bits and bars set an impressive record in higher production at lower cost. Chemically treated pins and bushings resist rust and corrosion. Prox Chains, fast and smooth operating, mean less breakage and down-time. Equipment made by Frank Prox Company means lasting dependability and efficiency.

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CHARLESTON ELECTRICA SUPPLY CO.

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They're safer. The steel ferrule is swaged on by machine, thus insuring a uniformity and reliability not attainable in connections dependent on human skill.

They're quicker to install. Upson-Walton electric cutting fuses the wire ends together into a neat, ravelproof rope-end, providing for easy attachment.

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Fasten the free end of your swing rope with Upson - Walton dropforged steel wire-rope clips.

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MANUFACTURERS OF WIRE ROPE, FITTINGS, TACKLE BLOCKS-ESTABLISHED 1871

minimum to \$21.70 for underground workers and \$18.90 for surface men. The offer was made on the condition that the union recognize the need of increased production, with a boost of 2½% suggested as a "reasonable minimum" for this year. If the boost can be obtained, it would just about cover the cost of the wage hike and a higher price for coal would not be necessary, the board said.

Industry Presses Fight On Residual Imports

Industry efforts to secure legislative relief from the increased flow of imported residual fuel oil were stepped up last month as Congress convened. Active in the campaign to secure legislation limiting residual imports were the Foreign Oil Policy Committee, representing the coal industry, independent oil producers and labor unions affected, plus the National Coal Association, Southern Coal Producers' Association, regional associations and individual operators.

and individual operators.

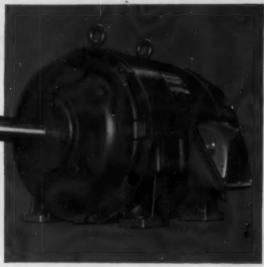
The opening barrage in Congress was fired Jan. 11 by Rep. Robert C. Byrd, of West Virginia. While acclaiming the attention to "human problems of our citizens" in the President's State of the Union message, Congressman Byrd charged that residual oil imports account for "much of the unemployment existing in the finest coal fields of our Nation" and warned that "action, not words, is the order of the day as far as unemployed men are concerned."

President Eisenhower was asked Jan. 6 by the Foreign Oil Policy Committee to make a "reexamination" of national foreign trade policies as a means of determining whether they are in the "best interest" of the U. S. economy and security. The request was made in a resolution adopted at the FOPC meeting in Chicago in December and sent to the White House by L. Newton Thomas, committee chairman and president of the Carbon Fuel Co. In his letter of transmittal, Mr. Thomas emphasized that the impact of foreign oil shipped into the country "merits the special attention" of the executive branch of the government.

the executive branch of the government. Speaking Jan. 12 before the Annual Top Management Night of the Industrial Management Club of Richmond, Va., Joseph E. Moody, president of the South-ern Coal Producers' Association, called on Congress to end the Nation's so-called Reciprocal Trade Program and establish a new foreign-trade policy that will offer adequate protection to coal and the many other industries being injured by imports from cheap-labor foreign countries. Pointing to the great differential between wages of American and foreign labor, he maintained that many American businesses cannot compete with unrestrained foreign imports unless we lower our wage level and thereby destroy our high standard of living and our economic stability. "We must be absolutely certain that we do not adopt free-trade policies which will import a depression into this country," Mr. Moody said.

The effect of oil imports on the coal industry received no mention whatever in the report of the Commission of For-

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FOR CLEANING-PLANT SERVICE,

Reliance Motors are built better to last longer. These Precision-Built Motors combine maximum strength with tough, vibration-proof Reli-X insulation and dust-proof conduit box and motor lead assembly. Write for Bulletin B-2101.

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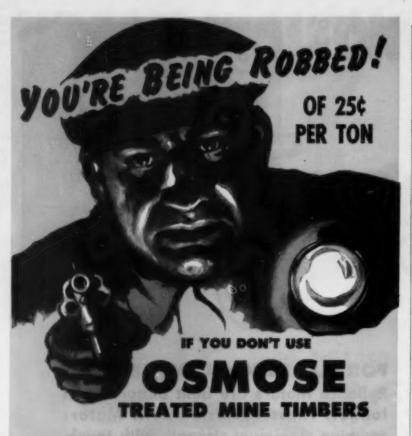
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RELIANCE ENGINEERING CO.

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COAL AGE · February, 1954

183



If you use untreated mine timbers, you are being "held up," not the roof. You're the victim, because they are robbing you of as much as 25¢ profit

WHY

DO THE NATION'S
LEADING COAL MINING COMPANIES USE
OSMOSE Treated TIMBERS?

Here's the report from: ISLAND CREEK COAL CO.

"We have been using Osmose Treated Timbers in our mines since 1942 . . . We are pleased to report that we are quite well satisfied with the results." on every ton you mine. 40% to 60% of your supply bill is for timber and timber replacement. We can CUT both of these costs by making mine timbers LAST LONGER.

Osmose Treated Mine Timbers are scientifically processed to resist decay and all wood destroying insects, and they last 3 to 5 times longer. With Osmose treatment ANY wood species, even beech, gum, hickory, ash, elm and maple, can be converted into long lasting timbers!

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and details on the type of Osmose service you prefer, (1. We sell you Treated Timbers or 2. You can buy our materials and treat your own Timbers.)

eign Economic Policy which Chairman Clarence B. Randall delivered to the White House Jan. 23, the National Coal Association pointed out. In a press statement Jan. 25, Tom Pickett, NCA executive vice president, called the report a "composite of contradictions that will serve only to arouse controversy." Coal and other industries which submitted "exhaustive studies made by organizations and individuals of integrity and repute" have "largely been ignored" according to two members of the commission, Congressmen Reed and Simpson, of New York and Pennsylvania, respectively, who filed a joint statement of dissent from the commission's findings.

NCA Education Group At Alabama University

The Vocational and Education Committee of the National Coal Association held a 2-day meeting at the University of Alabama Jan. 15-16. The meeting was one of series the committee has been holding at various institutions throughout the country offering courses in mining engineering and included discussions with university officials and faculty and interested industry representatives, study of the curricula offered and a survey of the school's facilities.

Following the meeting, it was generally agreed that the instruction was in good hands and that the equipment was adequate, but that the School of Mines needed the building that has been designed and for which the site has been selected. The University of Alabama is the only school in the southeastern states offering an accredited course in mining engineering it was pointed out.

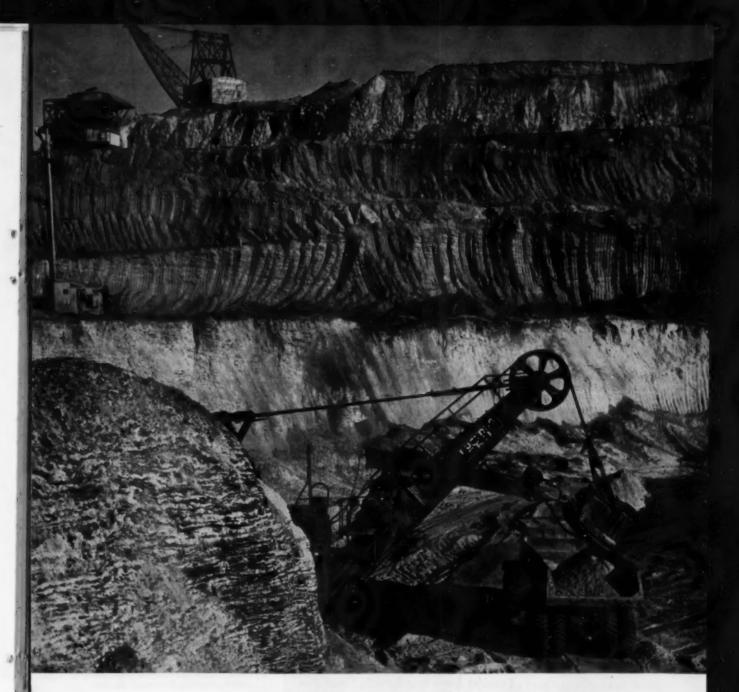
engineering, it was pointed out.

Members of the NCA Education Committee attending the meeting included Chairman H. C. Woods, chairman of the board, Sahara Coal Co.; R. W. Beamer, training director, Rochester & Pittsburgh Coal Co.; M. D. Cooper, director, Mining Engineering Education, NCA; L. I. Cothern, director of engineering, Jewell Ridge Coal Corp.; Dr. M. Edmund Speare, educational director, Bituminous Coal Institute; H. C. Walter, personnel manager, Lorain Coal & Dock Co.; and F. R. Zachar, general superintendent, Christopher Coal Co.

Committee guests during the sessions were: A. J. Blair, consulting geologist; C. S. Blair, president, Black Diamond Coal Mining Co.; T. J. Carpenter, vice president, DeBardeleben Corp.; V. W. Gandrud, USBM; J. W. Hager, general superintendent, Woodward Iron Co.; H. J. Hager, superintendent, Alabama By-Products Corp.; J. G. Hanlin, chief of Alabama Safety and Inspection; B. H. McCracken, manager, southern mines, Republic Steel Corp.; E. B. Nelson, general superintendent, coal mines, TCI Div., U. S. Steel Corp.; H. D. Pallister, senior geologist, Alabama Geological Survey; and Ralph D. Watt, mining engineer, southern mines, Republic Steel Corp.

NEWS of your company, personnel changes and other activities, are interesting to others, so why not be sure to tell us about them. Write The Editor, Coal Age, 330 W. 42 St., New York 36, N. Y.

OSMOSE WOOD PRESERVING COMPANY OF AMERICA, INC.
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IMPOSSIBLE WITHOUT EXPLOSIVES

120 million tons of iron ore, it is estimated, were mined in open pits and underground operations last year. This photograph shows some of the highly mechanized operations which make such huge production possible.

But before the ore can be dug, millions of pounds of explosives are used to break it loose from working faces, to assure easy shovel digging and rapid transportation of the ore to the crushing and washing plants.

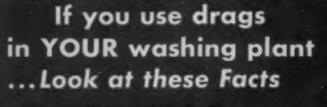
The manufacture of explosives and the knowledge of their efficient and economical use have been Hercules bysiness for 40 years. During this time we have studied the varying conditions under which explosives are used and have pioneered in developing the right types of explosives for industrial needs. Hercules explosives and services assure economical and efficient blasting not only in metal mining, but in coal mining, quarrying, construction—in fact, wherever explosives are used.

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Classifier will do a better job than drage in Your coal cleaning plant . . . and will save you money in the long run.

Simple design — rugged construction — no submerged bearings . . . these add up to low maintenance. Long term operating cost records in heavy duty metallurgical work show averages of 0.1 cent per ton of solids raked.

Compact HX design will save up to 50% in headroom over a drag installation on a comparable job.

Because pool area and rake speed can be varied, a Dorr HX can easily be adjusted to handle changes in feed characteristics. Conventional drag design provides for no adjustment.

A Dorr HX will unquestionably produce a cleaner rake product and a more uniformly sized overflow than a drag.

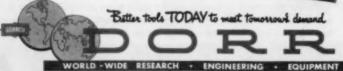


Consider these four facts . . . and then think about this. Installed cost of HX's

may be somewhat higher than that of drags... but any difference will be quickly offset by low HX maintenance.

Bulletin #2281 gives further details on the HX. Write to The Dorr Company, Engineers, Stamford, Conn.





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Offices, Associated Companies or Representatives in principal cities of the world.

New Books for Coal Men

Finding Strip-Land Acidity

Identification and Occurrence of Sulphides on Land Stripped for Coal, by G. H. Deitschman and J. W. Neckers. This booklet, the result of 3 yr of study on 55 stripping tracts in Indiana and Illinois, describes a satisfactory field testing procedure for determining the quantity of sulphides in stripped land. Though the tests were conducted in a limited area, the techniques may be applied almost anywhere. The Central States Forest Experiment Station and the Chemistry Department of Southern Illinois University collaborated in the study. Technical Paper 136. Free, Carbondale Forest Research Center, Carbondale, Ill.

Getting Most From Engineers

How to Attract and Hold Engineering Talent. If your engineers are unhappy in their present jobs (40% of those surveyed were unhappy), this book may help you. It's based on findings after interviews with 1,400 engineers, sponsored by the Professional Engineers' Conference Board for Industry and the National Society of Professional Engineers. \$2 per copy to non-members; \$1 to members. National Society of Professional Engineers, 1121 Fifteenth St. N.W., Washington 5, D. C.

Using Diesels Underground

The Development of Permissible Requirements for Safe Underground Diesel Haulage, by M. A. Elliott and R. S. James. Results of investigations and tests by the Bureau of Mines since 1937, including studies of experience in European mines, confirm the safety of diesels designed for underground use. Three major reasons for their safety are: (1) the flash point of diesel fuel is higher (from 120 to 230 F) than that of gasoline (0 to -50 F), resulting in safer storage and handling underground; (2) a diesel engine operates with a large excess of air that results in complete combustion and minimum output of harmful or objectionable gases; and (3) a diesel engine requires no electrical ignition system. USBM, I.C. 7673. 12 pp. 8x10%-in; paper; mimeo. Free. Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

Other Books and Booklets

The following publications by the Bureau of Mines may be obtained free upon request to Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. All are 8x10%-in; paper; mimeo.

A Study to Determine Potential Dust Exposure in Connection With Intermittent Rock Drilling in Coal Mines, by C. W. Owings and Leslie Johnson. R. I. 5004.

Anthracite Mechanical-Mining Investigations, Progress Report 5: Recovery of Anthracite in a Steeply Pitching Bed by Induced Caving, by Andrew Allan Jr. and R. S. Davies. R. I. 5013.

... and how it performs!



We've been asking you to "See it perform" when the Gundlach 2-stage Double Adjustable Coal Crusher, visited your coal fields.

Now we have positive proof of its excellent performance in the field. Mr. T. J. Gundlach has just completed a trip through the East Kentucky coal fields, demonstrating his crusher at many mines. The results obtained with the crusher, were enthusiastically praised by the operators of every mine that was visited.

Many letters were received, each praising the performance of the crusher. For example, here is a chart taken from one of the letters, showing the results of a test run of cool again proving Gundlach's superiority in minimizing the percentage of carbon and oversized cool.

	3"×114"	4"×114"	4" x 3"	4" x 3"
1" plus	6.64	6.14	8.25	4.46
1" x 34"	20.82	23.39	22.92	20.27
%" x 1/2"	35.84	33.37	31.17	31.02
34" × 34"	23.02	20.55	18.34	22.04
34" × 34"	7.24	8.81	9.01	10.50
16" x 0"	6.44	7.74	10.31	11.71
Totals	100.00%	100.00%	100.00%	100.00%

 If you would like to have the Gundlach 2-Stage Coal Crusher demonstrated at your mine, write:

T. J. GUNDLACH MACHINE COMPANY

BELLEVILLE,

Why they buy NEFF & FRY Storage Bins

In the photograph you see how the diagonal-ended staves of a Neff & Fry Storage Bin are laid up. They are grooved and beaded to lock together. Each course is encircled with as many galvanized steel rods as needed to withstand the thrust of the load.

Our bins (often termed silos or tanks) are used by scores of America's leading companies for handling more than 80 kinds of flowable bulk materials; notably, cement, coal, clay, grain, gravel, ore, sand, wood chips.

The reasons:

Formed under tremendous hydraulic pressure, the staves are rocklike in strength and density. They do not spall, rust, or burn.

Since the walls are only 2½" thick, the bins have great capacity in relation to outside diameter; no wasted ground area.

Despite the thin walls, the structures have sufficient load-bearing ability to carry heavy superstructures without additional supports.



Our wide experience enables us to make valuable suggestions regarding materials handling systems and equipment.

If you want to invest a few minutes in mighty profitable reading, ask for our folder, "Bins with the Strength of Pillars."

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228 Elm St., Camden, Ohio

NEFF & FRY SUPER-CONCRETE STAVE



- ★ In this way you can make up V-Belts in any length to fit any drive the fast economical way — V-Belts that perform exceptionally well.
- ★ In contrast to link-type belts these ALLIGATOR fastened V-Belts have just one strong joint . . . stretch. and follow-up maintenance are reduced to a minimum.

ALLIGATOR INTRODUCTORY V-BELT



DRIVE UNITS contain V-Belting, Fasteners and Tools — everything you need in one compact package to make up V-Belts quickly. Available in sizes A. B. C & D.

Ask for Bulletins V-215 and V-216 Order From Your Distributor

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ALLIGATOR V-BELT FASTENERS



are top performers in their fields for drilling test holes when prospecting or sampling . . . drilling blast holes for fragmentation of minerals or overburden . . . drilling and reaming escape, dewatering and ventilating holes . . . and drilling wells for other purposes. Fifty years' experience serving oil, water-well, mining and quarrying operations assures their value.



targe sits
for pilot hole drilling
and stage enlargement
reaming of dewatering, ventilation and

D370F—Frefabricated



Among the Manufacturers



McNally Pittsburg Begins Manufacturing Expansion

A MAJOR EXPANSION of its already extensive plant facilities in Pittsburg, Kan., has been undertaken by the McNally Pittsburg Mfg. Corp. to increase its capacity to serve its traditional market—the world's coal industry—and enlarge its manufacturing of products for other basic industries. Now under construction in a 4-block-long area alongside a modern foundry

in operation for several years is a large new machine shop to be equipped with the latest machine tools for the production of heavy machinery assemblies. Areas flanking the buildings will be made into an employees' parking lot on one side and a park open to the public on the other. The new shop is expected to be one of the most efficient and versatile in the Midwest and "it is anticipated that McNally Pittsburg's employment will increase materially in the future because of the added capacity" in the new machine division, company officials reported. Recently McNally Pittsburg acquired the engineering drawings and patterns for equipment manufactured by the former United Iron Works and plans to continue those services so as to diversify its manufacturing and expand its employment in Pittsburg, it was announced.



GUYAN Sealed Beam HEADLIGHTS for MINE EQUIPMENT

OUYAN Scaled Beam Headlights are made in three sizes to meet various mining conditions. The voltage rating is 6 volts for all three types. To operate from 250 or 300 volt trolley voltage we can furnish either a resister or a power unit.

Type 4 IN is recommended for gathering locemotives, shuftle cars and loading machines.

Type ML for main line losemotives has a narrow, powerful boom (70,000 boom CP.)

Type ML for main line leasmetives has a narrow, powerful beam (70,000 beam C.P.) Type 7 IN is a utility headlight using standard automobile lamp, two filaments, to project the beam either close or far. Write for Bulletin

GUYAN MACHINERY CO. LOGAN West Virginia

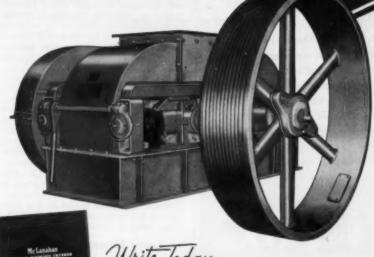
Le Roi Mining Manager

Robert L. McChain has been appointed manager of coal mining machinery sales, Cleveland Rock Drill Div., Le Roi Co., Cleveland. Prior to his association for several years with Le Roi-Cleveland in a sales capacity, Mr. McChain was with the U. S. Bureau of Mines at Johnstown, Pa., for 5 yr. Previously, he had been with several large coal-producing companies in Pennsylvania and West Virginia. The Le Roi Co. also announced the appointment of Hugh M. Little as a vice president of the company in charge of all co-ordinating activities between Le Roi and Westinghouse Air Brake Co., its parent firm, and with functional control of all manufacturing for Le Roi and its divisions.

Heads American Mine Door

American Mine Door Co., Canton, Ohio, has elected Charles Vignos II president, to succeed his father, the late Charles A. Vignos. Joining the company





for Bulletin BD-457

Used extensively throughout the anthracite and bituminous coal fields, these dependable McLanahan Black Diamond Crushers crack large or small lumps of coal or other materials to desired size with a minimum of fines. These machines are the answer to your coal crushing problems, and are built to handle high tonnages. Available in numerous sizes and types, these single and double roll crushers are constructed of steel, semisteel, or fabricated steel, with babbitt or bronze bearings for a long life of satisfactory service.

McLANAHAN & STONE CORPORATION

Pit, Mine and Quarry Equipment Headquarters Since 1835. Hollidaysburg, Pennsylvania

Dependable Products: Single and Double Roll—and Jaw Crushers, Crushing Plants, Reciprocating Plate and Apron Fooders, Rell Grizzilos, Conveyors, Elevators, Scrubbers, Steel Log Washers, Sand Drags, Hoists, Jigs, Dry Pans, Dryers, Scrap Bundlers, Pulleys, Care. Bearings. Sprackets, Sheaves, Rellars, Bin Gates, Elevator Buckets, Gratings, Car Wheels, Ferrous and Bronze Castings.



"IT'S OK. BOYS-THAT HEIL BODY IS BUILT FOR LOAD-SHOCK!"

 Heil Rock Bodies, fabricated of ¼" (or heavier) steel plate with rigid reinforcing provided by box-member ribs and 2" hardwood cushion sandwiched between bottom and wearing plate, will withstand the punishment of handling heavy loads of rock when loaded with big buckets.

 Strong-Arm Hoists raise and hold loads efficiently and dependably. Hoist frame takes all stresses imposed by action of the hoist without transferring any stress to truck frame.

· Heil Bodies and Hoists are individually engineered to your requirements for body length and load distribution. Write for Bulletin BH-52106.

DEPT. 7624, 3076 WEST MONTANA STREET, MILWAUKEE 1, WISCONSIN Factories: Milwaukee, Wis. — Hillside, N. J.
Sales Offices: New York, Union, N. J., Washington, D. C., Atlanta,
Cleveland, Milwaukee, Detreit, Chicage, Kansas City, Denver, Dallas,
Los Angeles. Seattle.



ROCK BODY

CONTRACTORS' BODY

ELEVATING TAILGATES

in 1917, he was assigned to almost every job in each department of the factory as expansion continued. He was elected to the board of directors in 1935, was made vice president in 1939, and in 1949 was elected secretary-treasurer.

Klein Named A-C Tractor V.P.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has appointed William J. Klein, formerly manager of the Minneapolis branch, Tractor Div., vice president and general sales manager of that division. Starting with Allis-Chalmers as a salesman in 1928, Mr. Klein was made a special factory representative in 1929 and company's Minneapolis opened the branch in 1930.

Fairmont Advances Graves

Vause R. Graves has been named sales manager of the Fairmont Machinery Co., Fairmont, W. Va. Mr. Graves joined Fairmont Machinery in 1949 as a sales engineer in Huntington, W. Va., and since last June has been working out of the company's main office. Before becoming associated with Fairmont Machinery, Mr. Graves was with the Jeffrey Mfg. Co. for 30 yr, as a sales engineer from 1930 to

Hewitt-Robins Promotes Two

Hewitt-Robins, Inc., Stamford, Conn., has promoted F. L. Griffith Jr. to the newly created post of general sales man-ager of the rubber and conveyors divisions, with headquarters in Stamford, and F. W. Blanchard, to the newly created post of manager of operations of the industrial rubber division in Buffalo. Mr. Griffith, formerly assistant to the general manager of the industrial rubber and conveyors divisions, joined Hewitt-Robins in 1949. Mr. Blanchard, joining Hewitt-Robins in 1936 as an engineer and draftsman in the industrial rubber plant at Buffalo, subsequently became plant engineer, chief engineer, and, in 1945, factory manager.

Jeffrey Opens Utah Office

The Jeffrey Mfg. Co., Columbus, Ohio, has opened a district office at 8 E. Third South, Salt Lake City, Utah. Carey S. Allen has been named district manager to handle the products of the company's Mining Div. For the past year Mr. Allen was Jeffrey's direct representative working with National Equipment Co., Salt Lake City, which firm will continue to promote and sell products of Jeffrey's Conveyor Div. Prior to that he was manager of mining renewal parts sales in the home office at Columbus.

Carboloy Expands Offices

Carboloy Dept., General Electric Co., Detroit, in a step designed to further concentrate its nationwide services, has organized as new field districts to handle its entire line the Allegheny district in Pittsburgh, and South Central in St. Louis. A 10% expansion of the district sales staff in the company's eight districts will be made. J. D. Kennedy, manager of product projects in Detroit, has been named manager of the newly-created South Central sales district. Manager of

BELKNAP COAL WASHING SYSTEM

OFFERS SMALL AND MEDIUM-SIZED COMPANIES IMPORTANT features for "Packaged Plants", including these primary essentials—basic structure—prescreening and sizing—duplex washing—closed system solution recovery—sludge recovery—storage and salvage tanks—pumps—all engineered and designed to fit your present operation . . .

Investigate These Advantages

- 1. Low Capital Investment—The purchase price of a Belknap System is less than that of other systems providing duplicate features.
- 2. Low Calcium Chloride Consumption— Tests show cost range from 1.9 to 3.5 cents per ton in the five most recent plant installations of the New System.
- 3. Low Water Consumption—Water may be a serious problem confronting many operators. Water consumption in the above new plants has averaged less than three gallons per ton of coal washed.
- 4. Low Maintenance and Operating Costs— Example: A company quoted on operating cost of less than 5¢ per ton with a mantenance cost of

about ½¢ per ton over a four-year operating period. Power consumption was very low in comparison with other systems which they operated.

- 5. Sludge Recovery—In the New Belknap System the sludge is recovered as cleaned slack on the desludging unit.
- Closed System—By using a Solution Recovery System during operation and a Salvage Tank for draining the washer during maintenance and inspection, no solution is wasted to the streams.
- 7. Automatic Specific Gravity and Level Control—With the Automatic Control minimum manual supervision is required to obtain maximum cleaning efficiency.

The NEW BELKNAP

COAL WASHING SYSTEM is available in capacities from 40 tons to 250 tons per hour and size ranges as wide as 7" x \(^2\sigma^n\). (\(^1\sigma^n\) on special applications.)



The NEW BELKNAP

COAL WASHING SYSTEM has been developed and proved during the last three years in new plants in West Virginia, Virginia, Pennsylvania and Indiana.

FUEL PROCESS COMPANY
"D" at 10th AVE. ... SOUTH CHARLESTON ... WEST VIRGINIA





COAL MEN ON THE JOB . . . CENTRAL COAL CO., Van Lear, Ky.: Virgil Bowling (left) and Pat McCoart, partners, who are using a shuttle carbuilt from auto and truck parts that hauls a 3-ton load (p 116 of this issue).

the new Allegheny district is C. W. Powell. Alfred M. Thomson Jr., Carboloy sales representative, has been named manager, East Central sales district, with headquarters in Cleveland. He joined the organization in 1940 and became a sales and service engineer in 1945. Mr. Thomson succeeds W. S. Baker, who has been made manager of tool sales in Detroit.

Hendricks LeT-W Sales Head

W. E. Hendricks, who has served as assistant to the general sales manager for LeTourneau-Westinghouse Co., Peoria, Ill., since last June, has been named domestic sales manager, succeeding H. R. Powers, who has resigned. When he joined LeTourneau-Westinghouse, Mr. Hendricks was in charge of governmental sales and prior to coming to Peoria, he served as sales manager for a company distributor in Pittsburgh. Previously, he spent 11½ yr with the LaPlant-Choate Mfg. Co., advancing to assistant sales manager in charge of the field sales force.

Mosebach Ownership Acquired

Mosebach Electric & Supply Co., Pittsburgh, has reported that all its outstanding stock has been acquired by Harold J. Evans and Ralph M. Nadler from Ray Hampton and associates. Mr. Hampton has resigned his position as Mosebach president to return to his own distributing business in West Virginia. For 30 yr a leading manufacturer and distributor for the mining industry, Mosebach is now expanding its facilities to serve mills, railroads, utilities and other industries. "The same high quality of products and service that characterized Mosebach's past growth will be continued," Messrs. Evans and Nadler declared.

Buzard Heads IH Truck Sales

International Harvester Co., Chicago, has named Ralph M. Buzard manager of its motor truck sales department, suc-



COMPLETELY RE-DESIGNED Around a 40 H. P. ENGINE

. This HI-SPEED DRILL is designed for drilling 5 - 6 - 8 inch holes to 100 feet or more. The 40 H. P. engine with four drilling speeds makes possible the reduction of footage time by one third. This new drill, the very latest in design, is equipped with self-starter and generator, dual type front wheels, truck type rear axle with hydraulic brakes and traction drive with both forward and reverse. Here is greater speed in retrieving augers and four rotating speeds and reverse for drilling and cleaning the hole. Here is accuracy and mobility. Here is the modern answer to faster, lower-cost drilling.

Send for Complete Details.

PARIS

MANUFACTURING CO.

PARIS, ILLINOIS



Apply "Formula 5" direct to coal. No mixing, no extra handling. Comes in tough 100-lb. bags with asphalt laminated ply. Send today for more information!

*"Formula 5" is a free-pouring, dry application composed of sodium chloride (30-70 mesh), a special anti-corrosive compound, and scientifically screened to produce an ideal dissolving rate.

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7	Industrial Division Chicago 3, III.
	Department CC2
Please s	end me your free booklet about "Formula 5".
Please s	end me your free booklet about "Formula 5".
Nome	



The big news in bearings—news from ESF—is the Type "C" Spherical Roller Bearing—as a replacement for ordinary sphericals, size for size, lasts 2 to 3½ times longer, increases capacity up to 50%.

This improved design is now available in ESSF's famous Triple-Seal "SAF" Pillow Blocks.

You get this longer life and increased capacity in addition to—

- Effective sealing from dirt.
- Lubricant retention.
- Adapter mounting for tight fits on standard shafting.
- · "Free" or "Held" design.
- Easy installation and inspection.
- · Self-alignment.
- . NO INCREASE IN COST!

YOUR SOUP DISTRIBUTOR will give you complete details about the "C" bearing and a copy of SOUP Bulletin No. 365 which contains technical data, sizes available, increased life and capacity you can expect for each size.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

- manufacturers of SKF and HESS-BRIGHT bearings.



ceeding W. K. Perkins, who will become staff assistant to the vice president, working on special assignments. Mr. Perkins has been away from active duty with the company for some time because of ill bealth. Mr. Buzard began his Harvester career in 1922 as a district salesman and held various sales posts until he became an assistant manager of motor truck sales in 1946.

Copps Atlas Powder V.P.

Atlas Powder Co., Wilmington, Del., has elected D. J. C. Copps a vice president in charge of the company's explo-sives, industrial finishes and engineering departments. Mr. Copps, who joined Atlas in 1929, was elected to the company's board of directors and executive committee last June. He has been general manager of the explosives department since February, 1953, and is succeeded in that capacity by W. Clayton Lytle. Joining Atlas in 1917, Mr. Lytle held posts in various Atlas explosives plants before being named operations di-Darco Corp., a producer of activated car-bons now wholly owned by Atlas; and following the war, he managed the company's explosives research division. Harry L. Moat has been named assistant to the director of operations of the Atlas explosives department, coordinating the activities of all explosives manufacturing sections. Joining Atlas in 1918, Mr. Moat has been on the department staff in the Wilmington headquarters since 1931.

Goodyear Advances DuPree

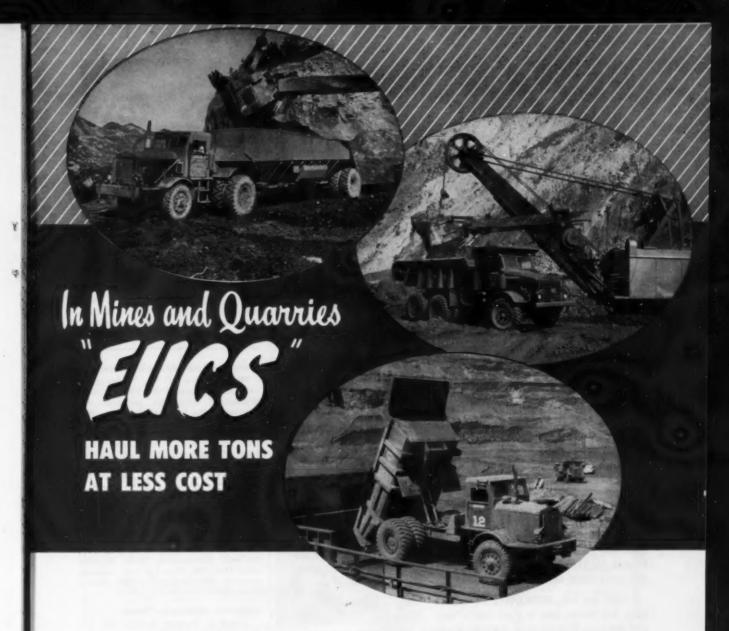
Goodyear Tire & Rubber Co., Akron, Ohio, has named Sam DuPree to the newly created post of general manager of all industrial products in an organizational alignment growing out of the expanding volume of business of the Industrial Products and Chemical Divs. With Goodyear since 1934, Mr. DuPree for the past year has been assistant to the sales vice president, R. S. Wilson, as liaison executive with four divisions of the company. In his new position Mr. DuPree will coordinate and supervise all phases of Goodyear industrial products.

Barber-Greene Moves Gilbert

Barber-Greene Co., Aurora, Ill., has appointed L. H. Gilbert to the Middle-Atlantic area sales headquarters, Washington, D. C. Mr. Gilbert, who succeeds Gordon W. Whitney as assistant to area sales manager Kentner Shell, joined the company in 1951 and has specialized in conveyor design. Mr. Whitney, a B-G engineer since 1947 and in the Washington office since 1950, has been promoted to be a member of Barber-Greene field engineer group.

New Euclid Div. Manager

The Euclid Div., General Motors Corp., Cleveland, has appointed W. P. Sutherland district manager of a newly created Euclid territory in the middle west. Headquartering in Chicago, he will be int charge of all Euclid operations in Illinois, Wisconsin, and parts of Indiana and Missouri. W. R. Brown succeeds Mr. Sutherland as Euclid district representative in Minnesota and northern Michigan.



Built for tough off-the-highway hauling, Rear-Dump and Bottom-Dump "Eucs" have stepped up production and cut hauling costs on hundreds of open pit mining and quarry operations.

Euclids have proved their efficiency and long life in hauling a wide variety of materials...coal, ore, rock, overburden and other heavy excavation. Bottom-Dumps are powered by diesel engines of 190 to 300 h.p... loaded speeds up to 34.4 m.p.h... available in 20 to 40-ton capacities. Rear-Dump "Eucs" have travel speeds up to 36.3 m.p.h... powered by diesel engines of 125 to 400 h.p... range in capacity from 10 to 34 tons.

Your Euclid Distributor has performance data on jobs similar to yours. Ask him for a Euclid hauling cost estimate — there's no cost or obligation.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio



Euclid Equipment



FOR MOVING EARTH, ROCK, COAL AND ORE



... GRUVAJOINTS

lightweight couplings for grooved pipe

GRUVAJOINTS — for grooved pipe systems carrying pressures up to 500 psi — cost considerably less than ordinary grooved pipe couplings. You get substantial freight savings, too, because GRUVAJOINTS weigh up to 45% less than conventional couplings.

Light and trim, GRUVAJOINTS are easy to apply and remove; easy to store; can be used over and over. They are made of malleable iron for 2", 3" and 4" pipe — protected with green rust inhibitor.

easy to e used

The GRUVAJOINT sealing gasket is interchangeable with those in GRUVA-

GRIPS (standard weight grooved pipe couplings).

GRUVAJOINTS couple perfectly with GRUVAGRIP
FITTINGS.

See new GRUVAJOINTS this week at your supply store!



Write today for illustrated folder describing GRUYAJOINTS and other G-B pipe coupling products — GRUYAGRIPS, GRUYAGRIP FITTINGS and ROLAGRIPS (for plain end pipe). Ask for folder CCF.



210 West Tenth Street

Kansas City 6, Missouri



COAL MEN ON THE JOB .

congleton Bros. coal co., Pacemaker mine, Beattyville, Ky.: Winfred Congleton (left), general manager; and Elbert Oaks, tipple foreman.

Hercules Powder Makes Changes

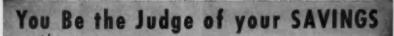
Hercules Powder Co., Wilmington, Del., has announced the retirement of William R. Ellis, vice president and member of the board of directors, after 39 yr of service. Mr. Ellis served as assistant manager of the San Francisco office until transferred to Wilmington, in 1933, as assistant to the general manager of the Explosives Dept. In 1936, he was appointed general manager of that department, and, a year later, became a director of the company. He was elected vice president in 1945. Milo A. Nice has been appointed manager of the technical service division of Hercules Explosives Dept. succeeding John H. Horlick Jr., who has retired, also after 39 yr of service with the company. With Hercules since 1923, Mr. Nice has been assistant manager of the technical service division since 1950.

Ryerson Advances Three

Joseph T. Ryerson & Son, Inc., has appointed Weaver E. Falberg assistant general manager of sales for the company's 16 steel-service plants, with head-quarters in Chicago. Mr. Falberg joined Ryerson in 1936 and was formerly manager of the alloy steel division. Roland W. Burt has been named manager of the Chicago plant, a newly created position. Succeeding him as sales manager, Chicago, is Alfred J. Olson, assistant sales manager since 1947. Both Messrs. Burt and Olson are 30-yr Ryerson men.

Goodman Acquires New Line

Goodman Mfg. Co., Chicago, has acquired from Diamond Iron Works, Minneapolis, its line of crushing, screening and handling equipment for rock, sand and gravel, and hogs and chipmills for the meat packing, paper and wood industries. Operating as Diamond Iron Works, Div. of Goodman Mfg. Co., manufacturing will be transferred to Goodman's main plant in Chicago. Key Diamond personnel concerned with sales,



TALCOTT Belt Fasteners

BREAKING STRAIN,





At our expense convince yourself with this free test: On a individual surface conveyor belt, make a joint with Talcott Fasteners. Work it hard — then figure your savings through longer belt life without breakdowns, due to our fasteners' close pliable joint that sets records for break-resistance. Finally, multiply proved savings on this test by your total number of belts in use — and you'll have good reason to send us your order for a complete Talcott Fastener installation. Fair enough?

Send for Free Samples

Without obligation, write for free samples of Talcott Fasteners for testing. State kind of belting (leather or rubber? transmission or conveyor?), width, thickness or number of plies, extra covers or not, diameter of smallest pulley. Ask about Talcott Fasteners for patching, too.

W. O. & M. W. TALCOTT, INC. Providence, R. I.



In hand hoists -

OVER 80 SIZES AND MODELS TO FILL ALL YOUR NEEDS



4 SPUR-GEAR HOISTS 1/4- to 25-ton



RATCHET LEVER HOISTS

10 reller-chain models - 1,500to 30,000-lb.

2 coil-chain models — 1,500 and 3,000-lb.



CHALLENGER **4 LIGHTWEIGHT** SPUR-GEAR HOISTS

3 models — 1/2-, 1-, and 2-ton



MIGHTY-MIDGET PULLERS

2 sizes-500and 1,000-lb.



HOIST-ALLS two sizes 1-, and 2-ton capacities



EXTENDED HAND WHEEL HOISTS 6 models - 1/4 - to 3-ton

ARMY-TYPE HOISTS (plain and geared) 11 models - 1/4 - to 10-ton LOW HEADROOM HOISTS 12 models - 11/2- to 24-ton

CLEVIS-CONNECTED HOISTS 11 models - 1/4 - to 10-ton DIFFERENTIAL CHAIN HOISTS

2 sizes - 1/2- and 1-ton HOIST BINDER 3,000-lb, capacity

Ask for more information on the units you need from the most complete line of hand-operated hoists. Write Dept. G2.

COFFING HOIST COMPANY

DANVILLE, ILLINOIS







COAL MEN ON THE JOB . . .

REPUBLIC STEEL CORP., Republic mine, Pikeville, Ky.: B. M. McKinney (left), master mechanic; and W. W. Moore, assistant master mechanic.

engineering and service will be retained under Carl E. Hanson, sales manager, and W. Eckley, chief engineer, who will headquarter in Chicago.

Flexible Lacing Adds Salesman

Vertner S. Kenerson, active in the industrial transmission and materials-handling industry for over 13 yr, has been named by the Flexible Steel Lacing Co., Chicago, to represent it in the Virginia territory, replacing Warren Paulson. Mr. Paulson, who also has covered Ohio and West Virginia, will now handle eastern Kentucky as well.

Long Super Mine Changes Name

Change in name of the Long Super Mine Car Co., Oak Hill, W. Va., to The Long Company, effective Feb. 1, was announced last month by J. B. Long, president. Pointing out that the old name has been outgrown because of the company's growth to manufacturing a wide variety of mining and conveying equipment and distributing a complete line power-transmission equipment, Mr. Long said there would be no change in ownership or management of the firm.

Gorman-Rupp Names Campbell

Gorman-Rupp Co., Mansfield, Ohio, has named as east central district representative, C. F. Campbell, associated with the company in sales, advertising and production assignments since 1946. Mr. Campbell's appointment is part of the company's expansion program in sales and service in various fields, it reports.

ACF Expands Car Manufacture

Application of roller bearings to freight cars on a mass-production basis currently under way at the Huntington, W. Va., plant of the American Car & Foundry Co., is the first high-capacity installation in the world and the only one where the preparation of railroad freight-car axles for roller bearings can keep pace with a freight-car production line, company officials report. Presently going through the

shop, where ACF recently spent some \$400,000 for new facilities, are 600 roller-bearing-equipped covered hopper cars being built for the Atlantic Coast Line R.R. The methods and equipment were developed by ACF engineers over a 5-yr period and include specially built machines that permit production at the present rate and at the same time maintain the high degree of precision necessary. A preview of the new production facilities was given a group of some 80 railroad officials and industrial magazine editors in mid-December, at which J. M. Reibel, ACF advertising manager, and other company officials played host.

Reliance Advances Two

Reliance Electric & Engineering Co., Cleveland, has promoted C. V. Gregory to the newly created post of manager of district sales. Elwood H. Koontz, branch manager of Reliance's sales office at Newark, N. J., succeeds Mr. Gregory as Pittsburgh district manager. In his new position, Mr. Gregory, who joined the company in 1928, will be responsible for coordination and administration of district sales activities. Mr. Koontz joined Reliance in a sales engineering capacity in 1936.

IH to Make Heil Tractors

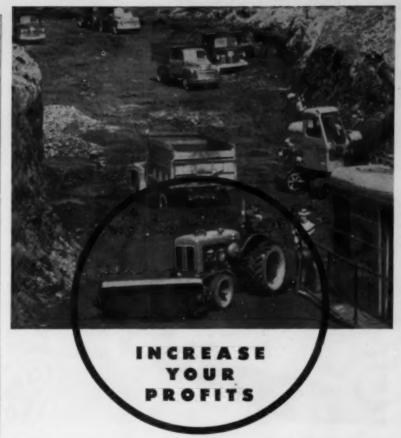
International Harvester Co., Chicago, continuing its program to round out full line of equipment in the industrial power and earth-moving industry, has made an agreement with the Heil Co., Milwaukee, Wis., which will enable IH to manufacture two-wheel rubber-tired industrial tractors for use in heavy construction. Announced jointly by Joseph F. Heil, president, the Heil Co., and H. T. Reishus, vice president, International Harvester Co., the arrangement provides that Harvester acquires Heil patents covering two-wheel tractors, and designs and manufacturing data which will materially shorten the time otherwise required by Harvester to engage in their production. Heil will supply Harvester with two-wheel tractors for an interim period and will also manufacture certain types of scrapers and wagons for Harvester during the agreement, which continues for a number of years. They will be sold through Harvester's industrial power division.

Morse Completes Ithaca Plant

Morse Chain Co., Detroit, has completed the \$1,400,000 modernization and expansion program in its Ithaca, N. Y., power transmission chain manufacturing plant. To provide for expanded chain-manufacturing plant facilities needed to meet increased demand for its products, Morse converted a 75,000-sq ft iron foundry in Ithaca to a punch-press and heat-treating plant and built a new 3,420-sq ft covered addition with railroad siding to provide steel-storage facilities.

Pruner Made Belt Sales Head

United States Rubber Co., Mechanical Goods Div., has named Henry E. Pruner, formerly sales engineer in the Chicago branch, manager of conveyor and elevator



with the SCHRAMM PREUMATractar

(TRACTOR - COMPRESSOR)

Equipped with rotary brush for sweeping overburden from your coal, the same unit will operate the SCHRAMM DeLuxe Pneumafeed self-propelled, self-powered wagon drill that can drill at a 270° arc at any angle and a distance of 9 ft. from center post.

Operated by one man the **Presentation** will PUSH . . . PULL . . . POWER anything a wheel tractor will and provide air for any pneumatic tools operated by a 105 c.f.m. air compressor.

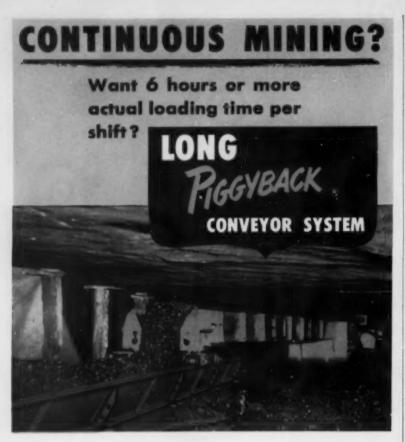
Write for Catalog 5340

SCHRAMM, INC.

The Compressor People

WEST CHESTER, PA.



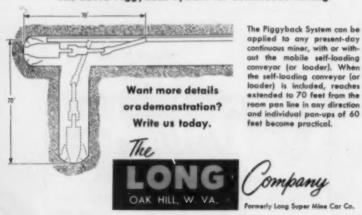


The Industry knows this to be a fact—by actual time studies, up to six hours actual loading time per shift is not unusual with the Long Piggyback* System—even when it is operated with mobile loaders in two or more rooms.

Now—this unique system offers the same advantages when used with any type continuous mining machine. The Long System utilizes practical, low-investment, low-maintenance chain conveyor equipment that has been proven in service. With the Piggyback System, enough potential advance can often be provided to allow operation of an entire shift without interruption.

* Trade Mark

The LONG Piggyback System for Continuous Mining



belting sales, succeeding George C. Crabtree, who has been named assistant district sales manager of the New York branch. Mr. Pruner has been associated with U. S. Rubber since 1945.

ACF Revises Western Sales

American Car & Foundry Co., New York, has made the following changes in its western sales area. John H. Van Moss, western sales manager at Chicago, has been made sales consultant with head-quarters in Chicago. Ellsworth B. Carpenter, district sales manager at St. Louis, has been made western sales manager with jurisdiction over the Chicago, St. Louis and San Francisco sales offices. John E. Angst, assistant western sales manager, has been named district sales manager at Chicago.

Nordberg Ups Division Heads

Nordberg Mfg. Co., Milwaukee, Wis., has made organizational changes in its Crusher, Screen and Process Machinery Div. as part of the company's continuing policy to increase its service, and to fill the vacancy occasioned by the retirement of Oscar Gruender, division consulting engineer. Jack B. Bond has been appointed assistant general manager of the division in addition to his present duties as sales manager. Howard M. Zoerb, administrative manager, has been named divisional consulting engineer.

Ryerson Handles Plastic Pipe

Joseph T. Ryerson & Son, Inc., Chicago, has announced that it will distribute plastic pipe and fittings produced by the Carlon Products Corp., Cleveland. Both flexible and rigid Carlon plastic pipe will be handled, and service on these products is available through the 16 Ryerson steel service plants throughout the country, the company reports.

Harrington in Leschen Post

Leschen Wire Rope Div. of H. K. Porter Co., Inc., St. Louis, has appointed H. A. Harrington to the newly created post of assistant general manager. Mr. Harrington, who has served the Porter organization in various capacities, was special assistant to Porter's executive vice president.

Firth Sterling Appoints Boot

Firth Sterling, Inc., Pittsburgh, has appointed Albert E. Boot as carbide service engineer in its mid-eastern district. Prior to joining Firth Sterling, Mrs. Boot was with Carboloy, Morse Twist Drill, and recently, with Wendt-Sonis.

ESB Moves Fitzmaurice

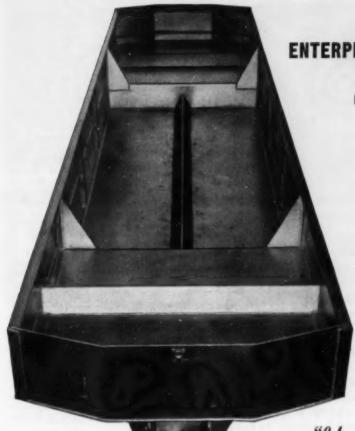
Edmund J. Fitzmaurice Jr., has been appointed sales engineering manager and advertising manager of the Electric Storage Battery Co.'s industrial division, in charge of industrial battery sales. With the company since 1941, Mr. Fitzmaurice has been supervisor of railway and motive power sales since 1950.

Carver Pump Names Tanner

Carver Pump Co., Muscatine, Iowa, has elected Robert E. Tanner vice president and general manager. Mr. Tanner also assumes the post of general sales manager. He was previously engaged in

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FOR "CONTINUOUS" MINING



ENTERPRISE HAULAGE EQUIPMENT

MINE CARS (4-Axle Cars, Thru-Axle Cars, 8-Wheel Cars)

- End Dump Cars
- Side Dump Cars
- Bottom Dump Cars
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EQUIPMENT HANDLING CARS

"Your cars custom-engineered for your specific needs"



NTERPRISE WHEEL & CAR CORPORATION

BRISTOL, VA.-TENN. •

HUNTINGTON, W. VA.

BY USING KOPPERS PRESSURE-TREATED TIES

Red Jacket Coal Corporation saves money in 3 mines



Typical installation of Koppers Pressure-Creosoted Mine Ties

• Red Jacket Coal Corporation uses Koppers Pressure-Creosoted Mine Ties in three of their mines: Red Jacket Mine, West Virginia... Coal Mountain Mine, West Virginia... Keen Mountain Mine, Virginia.

Koppers Pressure-Creosoted Ties are thoroughly protected against decay. As a result, they *retain* their strength and usually last 4 to 5 times as long as ties made of untreated wood. Savings in maintenance and

replacement costs are indeed substantial.

Service studies prove that it pays to use Koppers Pressure-Creosoted Lumber wherever wood must serve under severe conditions. To find out what this safer, stronger wood can do for you, send for our free booklet, "10 Proven Ways to Cut Mining Costs."

KOPPERS COMPANY, INC. Wood Preserving Division Pittsburgh 19, Pennsylvania



PRESSURE-CREOSOTED WOOD

sales work for the Continental Can Co., as well as the National Can Co., for which company he served as vice president

And For Your Information . .

Industrial Sales Div., Western Machinery Co., in Denver, Colo., has moved into new quarters at 2400 W. Seventh Ave. The new facilities include a 14,000-sq ft building and 2 acres of yard space, and, under the direction of Leigh M. Jones, Denver manager, is sales agent for many lines of mining, industrial and construction machinery in the Rocky Mountain area, as well as Wemco products and services.

American Cyanamid Co., New York, has named Kenneth H. Klipstein general manager of the newly created Research Div., which is responsible for the operation of the Stamford Research Laboratories under the direction of Dr. J. T. Thurston. It also will supervise other research and development programs which are not the direct responsibility of operating divisions.

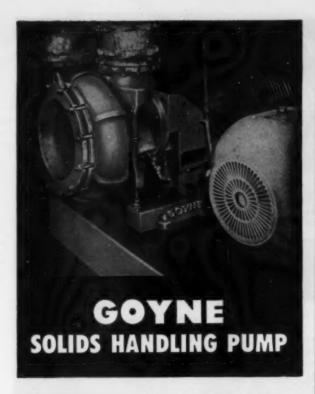
General Electric Co., Syracuse, N. Y., has appointed G. P. Foster regional manager for communication equipment in the Commercial Equipment Dept. for the Midwest, with headquarters in Chicago and responsibility for mobile two-way radio and microwave communication equipment. Joining G-E as a transmitter development engineer in 1945, he succeeds H. N. McNeill, who was recently transferred to Syracuse as manager of product service.

Norton Co., Worcester, Mass., has appointed Jack M. Esten an abrasive engineer and Robert C. Divoll a field engineer. Both are recent graduates of its sales training course. Mr. Esten will be responsible for the territory including North Carolina, South Carolina, Virginia and part of Tennessee. Prior to joining Norton, he was associated with John A. Roebling's Sons. Mr. Divoll will work out of the Pittsburgh district office.

The J. H. Fletcher Co., Huntington, W. Va., is erecting a \$20,000 addition to its present factory. The one story addition, 40 by 130 ft, will be of block construction.

The Hewson Co., Inc., Newark, N. J., has appointed the Harris-Hanson Co., 5506 S. Kingshighway, St. Louis 9, Mo., its representative for sales, field application and servicing of its products in southern Illinois, Missouri and eastern Kansas. Hewson also has appointed Fred A. Pease, P. O. Box 1566, Denver 1, representative for its line in Colorado, Utah, Montana, Wyoming, Idaho and New Mexico.

St. Paul Hydraulic Hoist, Minneapolis, Minn., has announced that the Chicago Hoist & Body Co., 8820 Vincennes Ave., Chicago, has been granted exclusive rights for parts of Illinois and Indiana to sell and service St. Paul's complete line of hydraulic hoists and dump bodies and other products.





GOYNE SOLIDS HANDLING PUMPS are extremely popular with a very large number of coal companies who find them quite reliable for pumping:

Liquids with solids added to increase specific gravities for coal and refuse separation in coal preparation plants.

Disposing of refuse and allt by pumping to wasts material banks or for back filling into mined out areas.

Pumping prepared coal to tem porarily desired storage areas.

These specially designed Goyne pumps incorporate numerous features to reduce upkeep and labor maintenance costs to a minimum:

- Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing only the rear head of the pump. No suction or discharge piping or any other major part of the pump is disturbed.
- The only packing box of the pump is subjected to the low suction pressure rather than to the discharge pressure developed by the pump. This feature assures long packing and shaft alsere life.
- Impeller clearance is adjusted while the pump is running, insuring constant pump capacity so essential for uniform washing.
- 4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.
- Spare parts are carried in stock at our plant for prompt shipment. Reduce your inventory by using Goyne Process Pumps.





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COVERS Link-Belt's entire roller bearing idler line of 34 types in seven basic designs. Includes all the facts you need for ordering and application: dimensions and specifications, selection and spacing data, recommended lump sizes, accessory information. Get your copy of Book 2416 today. Use the handy coupon below.



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Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Scattle; Scarboro, Torosto and Elmira, Ont. (Canada); Springs (South Africa); Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

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easier handling + better protection longer wearing . won't flame two weights . 36" to 96" wide

more uniform quality controlled in Dandux' own mills

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New York 6, N. Y.

SEARCHLIGHT SECTION

CRUSHER ENGINEER

Well known national manufacturer with multi-plant mining, quarrying, and manufacturing operations, has opportunity for an engineer with experience with large rock quarrying and processing operations and with knowledge of various types of processing and handling equipment. Experience should include practical application to crushing, grinding, and beneficiation problems for the home office engineering department located in Chicago. Responsibilities will include investigation of problems through to their eventual conclusion. Position is permanent. In replying, please state age, education, experience, and salary desired.

P1565 Coal Age 520 N. Michigan Ave., Chicago 11, III.

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Coal Mining ENGINEER

With proven record in mine layout, in-stallation, development and production: us-ing most modern methods on large scale production. Capable of taking complete charge of operation. Please submit full de-tails including age, references, past corn-ings. Confidential.

P1542 Coal Age 330 W. 42 St., New York 36, N. Y.

FUELS MEN WANTED

Tennessee Valley Authority has vacancies for professional men experienced in the production and transportation economics of fuels (particularly coal).

Engineers and economists with applicable experience in fuels are urged to apply.

One position is Chief of our Fuels Branch which will lead to a salary of \$10,000 within a reasonable time. Other positions range from \$3875 to \$7500. Retirement benefits, annual and sick leave, 40 hour week. The location is Chattanooga, Tennessee.

Write to the

TENNESSEE VALLEY AUTHORITY

Division of Personnel

Knoxville or Chattanooga, Tennessee

Mine Superintendent **Excellent Opportunity**

Southern coal mining company desires to employ a top flight production man. Must have had experience with conveyors and mechanical loading equipment. Should have proven ability to everse complete operation, including labor relations, preparation and under yound operation. Some knowledge of engineering and mechanical and electrical maintenance also required. Excellent opportunity for right man. Stable company and assured future. In reply give sue, experience, education, references, and approximate salary required. Also present occupation.

P9820 Coal Age 330 W. 42 St., New York 36, N. Y.

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EQUIPMENT USED OR RESALE

OPPORTUNITIES

FOR SALE

-9 W MONIGHANS—12 e.y. -200 W " 8 e.y. 5 W 6 c.y. 620 W PAGE 6 c.y. -120B Bucyrus (Comb.) 6 c.y. -1250 P&H Elec. Shovel 2½ c.y. 200W and 120B used very little

Catalog of \$2,000,000 used equipment furnished upon request.

J. A. TERTELING & SONS, INC. Box 1428 Boise, Idaho

For Sale

Complete 30-ton per hour coal briquette plant located at Fort Scott, Konsas. If net sold as a whole soon will sell by the piece.

Plant consists of:

2—drag type undertrack car unloaders

3—bucket elevators

1—rotary dryer, 5 Ft. x 30 Ft.

1—crusher, coal pulvarizer, 40 tons per hour

1—3 Ft. x 4 Ft. x 38 Ft. pug mill type mixer

1—No. 16 Webb briquette press

2—4 Ft. cooling conveyors, metal belt, total

284 Ft. of conveyor.

All of above include electric motor drive.

A. G. Sherwood Construction Co. Independence, Kansas

Ironton **Electric Locomotives**

New and used.
The Ironton Engine Company Farmingdale, New Jersey

WANTED - Immediately

Capstan, Endless & Winch type Carpullers. Railroad Car Shakeouts with motors & hoists. Mine Hoists in various capacities & speeds. Barney Hoists, Sgl. & Dbl., with motors.

Sal. & Dbl Roll Crushers. Overhead Hoists & Cranes.

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Lease or purchase—large or small tracts. Morgan Coal Company, 2850 North Meridian Street, Indianapolis 8, Indians.

Several thousand acres strip coal land to be sold. Near Ohio River in Ohio. BO-1547, Coal

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- 2-Low pedestal Joy 128U-9E Loading Machines, 250 V DC, permissible type, Serial Nos. 3330 and 3331, 28" high, Magnetax controls, new in 1947, just token out of service, completely rebuilt, guaranteed in new condition. Price only \$4500.00 each.
- 7-Jeffrey 35L Cutting Machines, 250 V DC, permissible type, Serial Nos. 24031-24032 -24641-24640 - 25959 - 25960 - 29258. proctically new Jeffrey 71/2' cutter bars and chains, 18" high, completely rebuilt. Price only \$2750,00 each.
- 2-Joy LaDel MTB 30" Belt Conveyors, one with 40 HP, 250 V DC and one with 40 HP, 220/440 V AC motor drive, and 3200' centers of 30", 42 ez., 5-ply Goodyear Belt,

speed reducers, intermediate sections, dripproof ballbearing idlers, head and tail sections, and all appurtenances. Practically

- 3—Continental Gin 30" Belt Conveyors, com-plete with 40 HP and two 25 HP, 250 V DC drives, intermediate sections, dripproof ballbearing idlers, head and tail sections, speed reducers, and 5200' of 42 oz., 5-ply, very good Goodyear belt.
- 32-Completely rebuilt low type 6, 8, 10, 13, and 15-ton Locomotives. Our Warehouse full of 150, 200, 300, and 500 KW late type Motor Generator Sets, Rotary Converters and Rectifiers; all types of Shuttle Cars: 8-BU, 14-BU and 11-BU Joy Loading

MAIL US YOUR INQUIRIES FOR LATE TYPE REBUILT EQUIPMENT

COAL MINE EQUIPMENT SALES COMPANY

306-307 BEASLEY BUILDING . PHONE LONG DISTANCE 34 . TERRE HAUTE, IND.

NEW and REBUILT

LOCOMOTIVES

11% to 10 Tons 18" to 561%" Track GREENSBURG MACHINE CO.

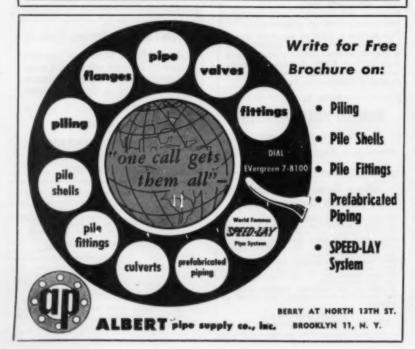
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2—1,250 ft. Pcs. 1-54" Roebling Locked Smooth Ceil Track Strond Wire Rope for Aerial Tram-way. NEW—NEVER USED. Apply to THE SNAP CREEK COAL COMPANY, P.O. Box No. 1029, or Tel. 1533, Logon, West Virginia.

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FOR SALE

PORTABLE LIGHTING PLANTS

(Gasoline Driven)

- (1) 3000 watts—portable—gasoline driven—115 volts AC 60 cycle single phase. Monual starting, driven by 2 cyl. 4 cycle radiator cooled angine with 3" bere—2\(\frac{1}{2}\)6" strake—1800 rpm. Suitable for use on dragline—contractors tools—lighting.
- (1) NEW portable 5 KW gasoline driven generator set. Hercules engine—4 cyl.—30 HP—radiator cooled—electric starting—mo-rine enclosure. GENERATOR: Schromm 5 KW 110 volts Dc 45.5 amps.—1750 rpm—serial No. 86N228—Model 5HCD.

1

3

DIESEL GENERATOR SETS

- (1) NEW 75 KW Cummins. ENGINE: Model MGD-radiator cooled 6 cyl. electric starting. GENERATOR: G.E. 75 KW—250 volts—300 amps.—1800 rpm—continuous duty. Serial No. 5GT1503N1.
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550 Velts D.C. — 38 in, track Gauge
4—006 Westinghouse I3 ton Haulage Locomotives
2—05 Wortinghouse Ston Maulage Locomotives
2—M168 Juffrey 6 ton Gathering Locomotives
2—78 joy Shortwall Cutters, with Bugdusters
22—25 you Shortwall Cutters, with Bugdusters
22—25 Joy Shortwall Cutters, with Bugdusters
22—35 Joy Shortwall Cutters, with Bugdusters
22—35 Joy Shortwall Cutters, With Bugdusters
22—35 Joy Shortwall Cutters, With Bugdusters
220—Watt Steel End Dump Mine care, 36 in. high,
68 in. wide, 156 in. hong, 3 ten capacity,
68 in. wide, 156 in. hong, 3 ten capacity,
68 in. wide, 156 in. hong, 3 ten capacity,
68 in. wide, 156 in. hong, 3 ten capacity,
68 in. wide, 156 in. hong, 3 ten capacity,
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H.P., U.E. motor, 4000 votts A.C. competes with control.

-Ottomwa from Works Noist. Capacity 21 ten on 25 degree slope. 500 F.P.M., with 150 H.P., 800 Vott D.C. Motor.

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THE VALLEY CAMP COAL COMPANY P. O. BOX 2005 ELM GROVE. WEST VIRGINIA

TELEPHONE — TRIADELPHIA, W. VA. 2010

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- 1 Chipmunk Laboratory Crusher (Power Drive) Jaw O 2½" by 3". Less Motor
- 1 Braun Pulverizer supplied with one set of Less Motor of 8" grinding plates.

Like New-Less than 100 samples have been handled by these machines

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-18" x 18" Jeffrey single roll -24" x 24" Jeffrey single roll -24" x 36" McNally-Pittsburg do -36" x 42" double roll -30" x 16" Williams pulverixer -36" x 48" Jeffrey hammermill Jeffrey single roll Jeffrey single roll McNally-Pittsburg double roll

1

TUGGER & SLUSHER HOISTS

—5 HP Brownie room hoist —5 HP Sullivan RH room hoist —7½ HP Sullivan double drum slusher hoist —10 HP Sullivan 3 drum slusher hoist

2—10 HP Sullivan 3 drum stusner noist
1—Ingersoll-Rand mod. 6HC air tugger hoist
2—6½ HP Sullivan tuggers, 250 v. DC
7—6¼ HP Sullivan double drum, 250 v. DC
1—10 HP Sullivan double drum driven by

Continental gasoline engine

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3—Ottumwa 20 HP box car loaders 2—Manierre 22 HP box car loaders -leffrey 20 HP bax car loader -Red Devil portable loaders, 12'x15" -Card portable loader, 11'x19"

SCRAPER CONVEYORS

1—Link Belt, 50' centers, 12" flights
1—Jeffrey, 75' centers, 9" flights
1—Jeffrey, 67' centers, 30" flights
1—Jeffrey, 70' centers, 30" flights
1—Jeffrey, 72' centers, 30" flights
1—Jeffrey, 88' centers, 36" flights
1—Jeffrey drag, 28' centers, 9" drags
1—Jeffrey drag, 26' centers, 30" drags

ROTARY DUMPER

1-Card rotary car dumper, 13'x5' platform



ELECTRIC HOISTS

-11 HP Vulcan #0 single drum -20 HP Vulcan single drum -22 HP Vulcan double drum

-25 HP Vulcan single drum -30 HP Vulcan single drum

-37 HP single drum -50 HP single drum

-50 HP single drum
-60 HP single drum
-100 HP Box single drum
-112 HP Vulcan single drum
-145 HP Vulcan single drum
-150 HP Vulcan single drum
-375 HP Box Single Drum Hoist, 800 FPM
with 375 HP GE Slipring Motor, 575 RPM,
complete with controller, grids and magnetic contact panel.

netic contact panel. 600 HP Box Single Drum Hoist, 25,000# Rope Pull, 900 FPM, Hydraulic Post Breaks with 600 HP Westinghouse Slipring Motor, 435 RPM, controls and magnetic contact panel.



LOADERS & CONVEYORS

1—8BU Joy loader
1—61EW Jeffrey elevating chain conveyors
1—61HG Jeffrey chain conveyor, 200'
1—61W Jeffrey chain conveyor, 200'
9—G-20 Goodman shaker conveyors

6-G-15 Goodman shaker conveyors

-Vulcan shaker conveyors -Joy ladel UN-17 shaker conveyors -Goodman HA duckbills



MINING MACHINES

7B Sullivan super short wall coal cutters 18—CE7 Sullivan coal cutters 1—CR3 Sullivan coal cutter -Jeffrey 28A coal cutter -Goodman 112-A coal cutter -Sullivan CH-11 ironclad shearing machine

-Jeffrey 29-C Arcwall coal cutter

SCALES -100 ton Fairbanks railroad scales 1—100 ton Howe railroad scale 1—125 ton Howe railroad scale

-5000# Fairbanks Tipple scale with weigh-

ing basket 1-5000# Howe Tipple scale

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5-3'x5' Tyler "Hummer" electric vibrating

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screen 48"x84" Jeffrey-Traylor electric vibrating

screen -40"x100" Tyler-Niagara 2 deck shaking

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screen

2 deck shaking screen, 18'x86"

4 deck shaking screen, 32'x84"

PIT CARS

125-60 cu. ft. Card steel coal mine cars 36" ga. ... Card steel coal mine cars -66 cu. ft. Card steel coal mine cars 36" ga.

SHUTTLE CARS

2-Joy Shuttle Cars, Model 42D5.

RAIL

We have in stock good relaying rail, 16# to 90# also new 16# to 20# with fittings.

STORAGE BINS

2—50 ton capacity steel bins CAGES AND HEAD SHEAVES -Card automatic self-dumping cages, 5'4" x 9'6" platform

x 96" platform

108" Card bicycle sheave wheels

96" wood filled sheaves

84" Card bicycle sheave wheels

72" bicycle sheave wheels

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-8-H Jeffrey 42" Aerodyne fans
-7' Jeffrey Aerovane 2 stage fan
-Jeffrey #61 exhaust blowers
-leffrey Aerodyne midget blowers
-2600 cfm Brown-Fayro exhaust blower
-3000 cfm Claridge exhaust blowers

PICKING TABLES

I-Link-Belt, 20' centers, 18" pans I-Card, 41'6" centers, 30" pans I-Card, 51' centers, 48" pans 1-73' centers, 30" pans 1-64' centers, 48" pans



ELEVATORS

1-Link-Belt, 42' centers, 6"x4" buckets, single chain, complete with steel housing Link-Belt, 36' centers, 18"x8" buckets, double chain

1-12' centers, 14"x7" buckets on belt 1-35' centers, 10"x5" buckets on belt

BELT CONVEYORS
1—Jeffrey 24"x13'
1—Barber-Greene, 24"x66'
1—Barber-Greene, 34"x135'
1—Barber-Greene, 30"x173'

LOCOMOTIVES

-2 ton Whitcomb, battery, 24" ga. -21/2-31/2 ton Mancha battery, 24" ga. 4 ton Westinghouse-Baldwin battery, 24"

ga. 4 ton Ironton, battery, 36" ga. 7 ton G.E. permissible battery, 36" ga.

-7 ton Atlas, battery, 36" ga.
-8 ton Ironton battery, 36" ga.
-8 ton G.E. battery, 36" ga.
-8 ton Goodman battery, 36" ga.
-10 ton Atlas battery, 36" ga.
-3 ton Whitcomb gas engine driven, 24" ga.

1-3/2 ton Viricomb gas engine driven, 1-2/2 ton Jeffrey trolley, 36" ga. 1-4/2 ton Goodman trolley, 36" ga. 1-5 ton Jeffrey trolley, 36" ga. 1-6 ton Goodman trolley, 36" ga.

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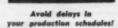
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RUBBER CONVEYOR BELTING

TOUGH COYERS—heavy duty, specially compounded abrasive resistant rubber covers having high tensile strength. Thoroughly copoble of withstanding the abrasive action of bulk materials. Preparity vulcanized to the carcous to essure atmost perfermance, aconomically. STRONG CARCASS—Constructed of finest quality 28 and 32 centre tough cotton duck, properly treated and impregnated to avoid mildred from moisture and atmospheric conditions. Each phythoroughly ambedded in rubber to prevent ply separation. FLEXIBLITY — Careful attention has been given in the construction of all bets to have the propor flexibility assuring the following desirable features: troughs easily, runs true on all idlers, gouge resistant, excellent for long and short houls and slope instellations.



We carry in stock for your immediate requirements, Conveyor Beiting in widths from 8 inches to 48 inches

			kness	Type of
Width	Ply	Top	Bottom Cover	Duck
8"	4	1/16"	1/32	28 Oz.
10"	4	1/16"	1/32	28 Os.
12"	4	1/16"	1/32"	28 Os.
14° 16°	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32	28 Os.
18"	4	1/8"	1/32"	28 Oz.
26"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32	28 Oz.
24"	4	1/8"	1/32"	28 Os
24"	5	1/8"	1/32"	28 Oz
26"	5	1/8"	1/32"	28 Oz.
30" 30"	4	1/8"	1/16"	32 Oz.
30"	8	1/8"	1/16"	32 Os.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Os.
42"	5	1/8"	1/16"	32 Oz.
48"	5	1/8"	1/16"	32 Oz.
36" 42" 48"		1/8"	1/16"	32 Os.

INQUIRE FOR SIZES NOT LISTED. ELEVATOR TRANSMISSION & V-BELT-ING ALSO IN STOCK.

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LOCOMOTIVES: 2-65 ton diesel electric, standard gauge, 0-4-4-0, in guaranteed condition. For sale or rent. 2-75 ton and 85 ton, electric, standard gauge, 600 volt, D.C.

gauge, 600 volt, D.C.
LOCOMOTIVE CRANE: Link Belt 25 ton, standard railroad gauge, gasoline powered, air brakes, cast steel trucks, backet handling, with or without 1½ rd. clam shell bucket. For sale or rent. Located Minne-

buckers some control of the control of the control of the capacity, transfer table 54 ft. Specific tions and photos available.

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KW G. E. Syn. 275 V. 900 RPM KW G. E. Syn. 275 V. 900 RPM KW G. E. Syn. 275 V. 1200 RPM

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2—1600 Amp. Automatic Reclassing Sectionalizing, Type KSC, Class 2, 275/375 V. In Steel Cubicles.
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1-300 KW West. Syn. 275 V. 1200 RPM 1-200 KW G. E. Syn. 275 V. 1200 RPM 2-150 KW G. E. Syn. 275 V. 1200 RPM of locomotives in sizes from 30-Ton to 4-Ton, 250 and 500 Veits, Track Gauge from 48" to 18".

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Mining equipment that includes

Mining equipment that includes
3—88U jsy Leaders, 6—42E Jsy Shuttle Cars, 5—
10 ton 30" Ga. and 1—4 tos 30" Ga. locometive,
5—M. 6, Sets—100 to 200 K.W. 2300 Volts A.C.
(all electric equipment 250 volts D.C. toss of 4,0
(7,6 Fig. 8 trolloy wire and all sizes of feed wires
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H.P. Bieter, another hoist complete with 400 H.P.
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man sharing machines, 1—7. Cat. Trace—Goodman sharing machines, 1—1. Cat. Trace for the
10 th. Rail, 200 ton 30 ib. Bieters, 7—30' longer
various other equipment of 30" Dis. 3—20' longths of 42"
Dia. x 9/32" pips. WRITE
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New 500 Gal. Skid Mounted STORAGE TANKS Shell of Vir Steel, 2" Outlet and 12" anhele in Top. LEFTON INDUSTRIAL CORP. 212 Victor Street, St. Louis (4) Me.

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90' Boam, twin 8-71 GM Dissel Engines, Long Craviers, Wide Past, One available in January 1954 and the other available in the Spring of 1954, These machines in excellent condition. Re-sently completely overhanded. Roal Bergain.

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40" track gauge

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Goodman Topourtor—712—AC

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1 Buckeye Diesel Motor 350 HP., 450 R.P.M. Complete with air starter and cooling tower. Five years old. Tom Gingell

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KVA 200 125 160 75 25 50 50 371/2	MAKE Pyh. West. G.E. G.E. (Pyranol) G.E. Allis G.E. G.E.	Pri. V. 23000 11000 2300/4160 2400/4160 2300/4160 2300 11000	Sec. V. 228/440 2300 230/460 129/240 230/460 115/230 230/460 230/460	Qs. 3 3 3 3 3 3 3 3 3 3

MOTOR GENERATOR SETS

MOTOR GEMERATOR 3173

BB KW G.E. 275 v. 3098 M PG-AT1 2309/4000 v.

00 KW West., 350 v. 729R-59ys.-8K 2309/4000 v.

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L 10RU SERIAL NO. 15569 with 11 Ft. Cutter Blade 220/440 Volt Motor MODEL TORU \$20,000.00

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11RU rubber tired Cutter, like new,
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Two 300 KW, G.E. HCC-6 Rotary Converters.
Allo oix 200, 150 and 100 KW Rotaries in stock.
All complete with transformers.
Three 75 and 100 KW Diesel Plants, all 250 volts
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Baby Goodman 212AA, 250 velt DC.
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Busit.
Also Standard 12AA and Universal, AC & DC.
Joy 11RU rubber tired cutter, 118, 78, & 581.
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LOCOMOTIVES
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LOCOMOTIVES

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4 ton to 22 toms, single and tandeau units, 45 in stock. 250 and 500 volt DC.

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Jeffrey 61 CLR rubber tirad Loaders, 24" high.

Myers Whaley & Goodman track Loaders. All DC.
250 Volts.

All types of Joy Loaders.

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Four 8000 Gallon Tank Car Tanks.
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3 All Steel Water Buxes, like new, 44" track gauge.
Mine Cars. 42", 44" & 48" Ga. Drop Bottom
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200 Transformers, 2 to 300 KVA, most popular
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1 Joy MTB 30" Belt Conveyor, 1200' centers.
1 Joy MTZ, 30" Belt Conveyor, 1200' centers.
10 Jeffrey 61 AM, 12" Chain Conveyors.
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Goodman 30" Nead & Tail Sactions, 97C,
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Barber-Greene 24" x 32" portable Belt Conveyors.

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Crushers, all sizes—Allis Chalmers 5' x 12' Vibrators, Gyroset 4' x 10' Vibrators, single and dauble deck.
Feeders, Picking Tables, Loading Booms, Hoists, complete tipples.

Copper Trolley & Feeder Wire, 1/0 to 1000MCM.
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New hydraulic tow trucks.
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Also many locomotive armatures.
Pipe Threading Machines.
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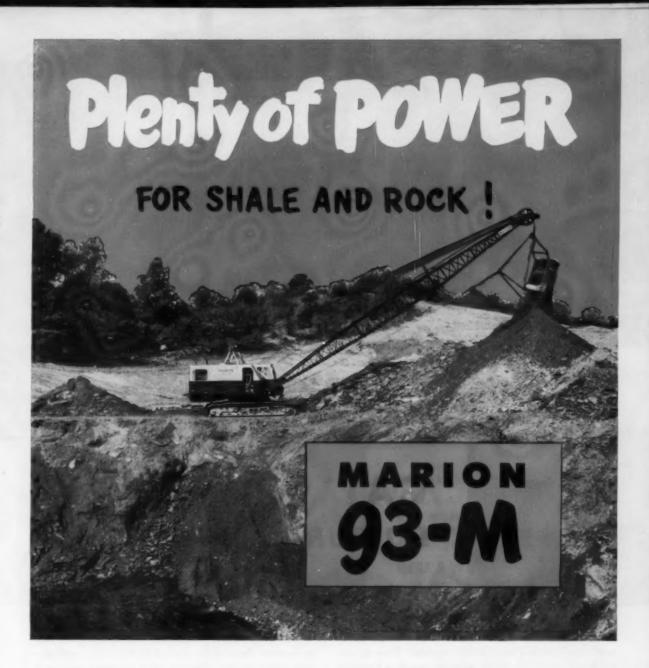
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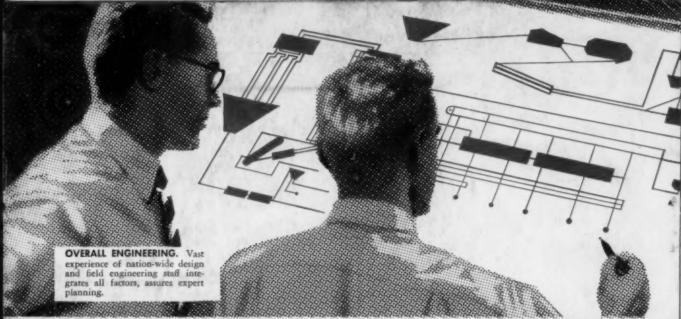
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